SEPTEMBER 10, 1951

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

Cultivating the
Know-How in Jet Engine Manufacture
—on page 90

TROUBLES IN COPPER
—New Stopper in CMP? p. 61

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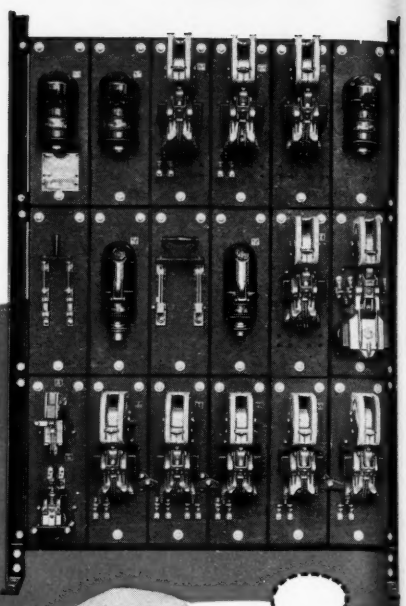
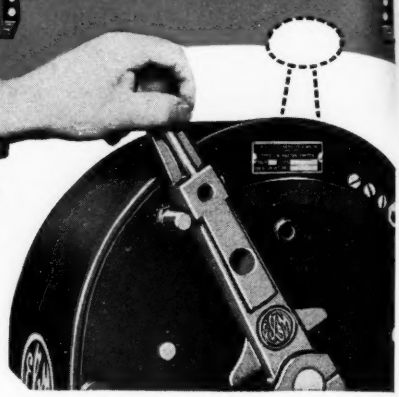
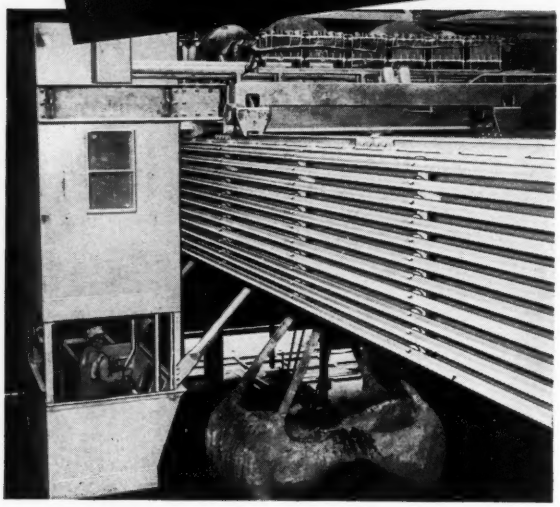
1. Time-Current Acceleration
2. Line-Arc Contactors
3. Wright Hoist Circuit
4. Tab-Weld Resistors
5. Cam Master Switches
6. Safer Electrical Interlocks
7. Bolted, Welded Frame
8. Quick Contact Renewing



NARROW WIDTH, SHORT THROW *Master Switches*



Where easy manipulation speeds output



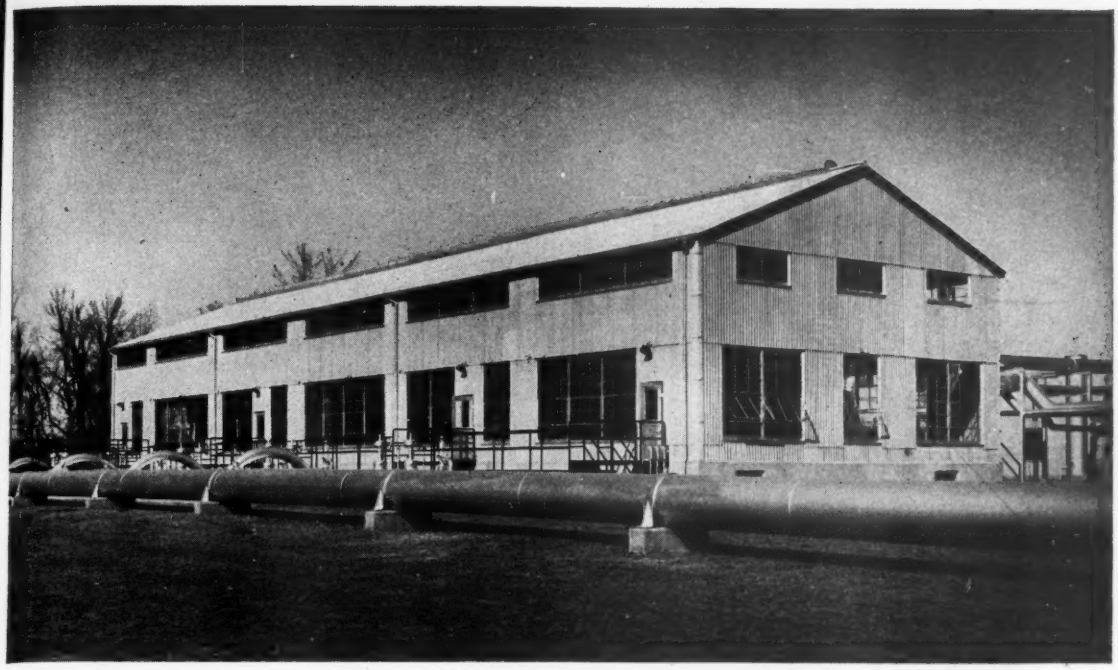
There's nothing like a 2-motor bucket crane or any extra-motion crane (such as ladle, double-trolley, etc.), to bring out master switch quality and popularity.

EC&M Cam Masters are popular because they are narrow in width. Several of them can be closely mounted so that an operator can conveniently reach them all without changing position.

Also lightening the task of the operator is the short-throw from off to full-on position of these masters. This materially reduces an operator's movements. Specify EC&M Bulletin 1190-A Cam Master Switches.

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET • CLEVELAND 4, OHIO



Pipe ranging from 24 in. to 30 in. in diameter was fabricated from ½ in. and ¾ in. Mayari R plate, for use in the Transcontinental Gas Pipe Line that connects the gas fields of West Texas with New York. This pipe was used at 12 different pumping stations along the line. Fish Engineering Corporation and Fish Constructors, Incorporated, handled the design, engineering and construction of the line.

Mayari R Pipe Withstands Vibration in World's Longest Gas Line

Because pumping equipment generates a certain amount of vibration, the builders of the 1840-mile Transcontinental Gas Pipe Line used Mayari R steel pipe at the pumping stations. The large-diameter pipe fabricated from this low-alloy, high-strength steel connects directly with the pumps, and extends some distance in both directions from the stations.

Mayari R was selected because its mechanical properties are substantially higher than those of carbon steel. It has a yield point, for instance, of 50,000 psi minimum, and an endurance limit of 50,000 psi. These properties permit the use of considerably higher working stresses.

It also has better resistance to impact and to atmospheric corrosion than carbon steel, which means longer service life.

And there are no fabricating problems with Mayari R; it can be cut, formed, punched and machined like carbon steel. The same equipment is used, although slight allowances may be required to offset the higher properties of this grade. Mayari R can also be welded by all of the usual methods.

Now widely used in structures, vehicles, and construction equipment as well as in many consumer products, Mayari R is making design improvements possible at low cost. To get more information on this material and its applications write or phone our nearest sales office for Catalog 259.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

Mayari R *makes it lighter... stronger... longer lasting*

STRONG LINK
in industry's mighty chain of steel

Plate steel, stampings, and fabrications to meet industry's vital needs pour steadily forth from Barium's Central Iron and Steel Company at Harrisburg, Pennsylvania.

Central is a key link in the chain of fifteen Barium Steel Corporation subsidiaries that provide a single, integrated source of supply for steel in many forms . . . plate, structurals, forgings, stampings, springs, bolts, nuts.

These strategically located companies can completely coordinate operation and output to meet all your steel needs. That's why Barium is better able to help you solve your steel problems.

Put Barium's quality-controlled source of supply (from blast furnace to end product) to work for you. Get in touch with Barium Steel Corporation at 25 Broad Street, New York City.

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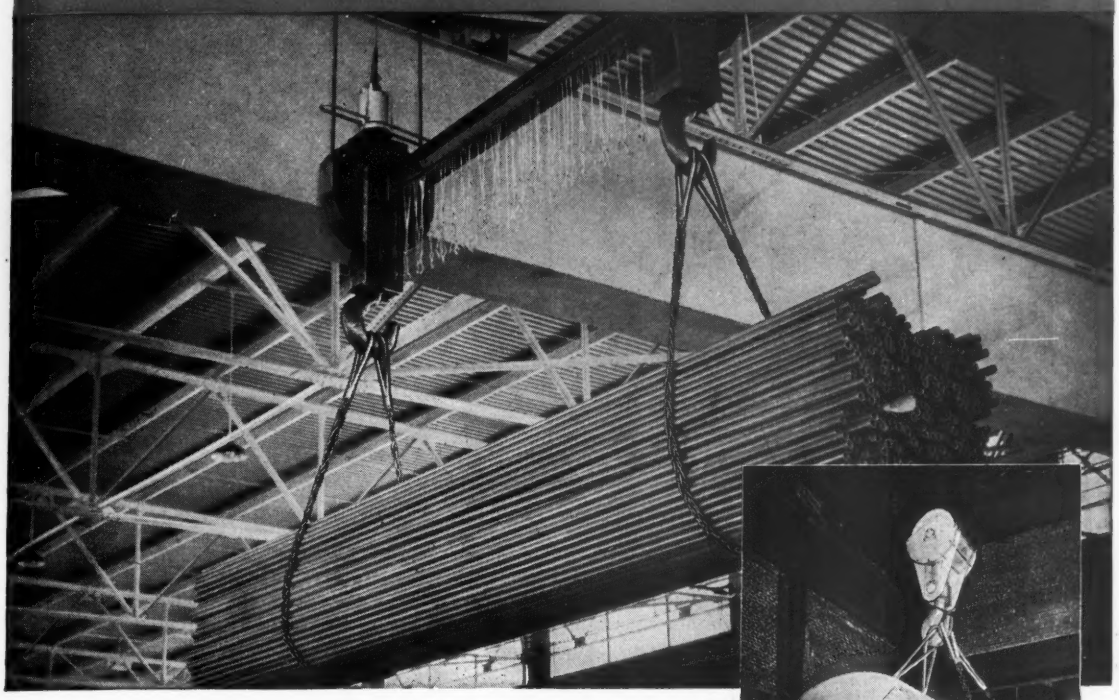
MACWHYTE SLINGS AT WORK



Macwhyte DREW Type 1 Flat-Braided Slings handle loose bundle of steel pipe

125-ton generator unit handled with Macwhyte ATLAS Type 1 Round-Braided Slings

Macwhyte MONARCH Cable-Laid Grommets handling large casting

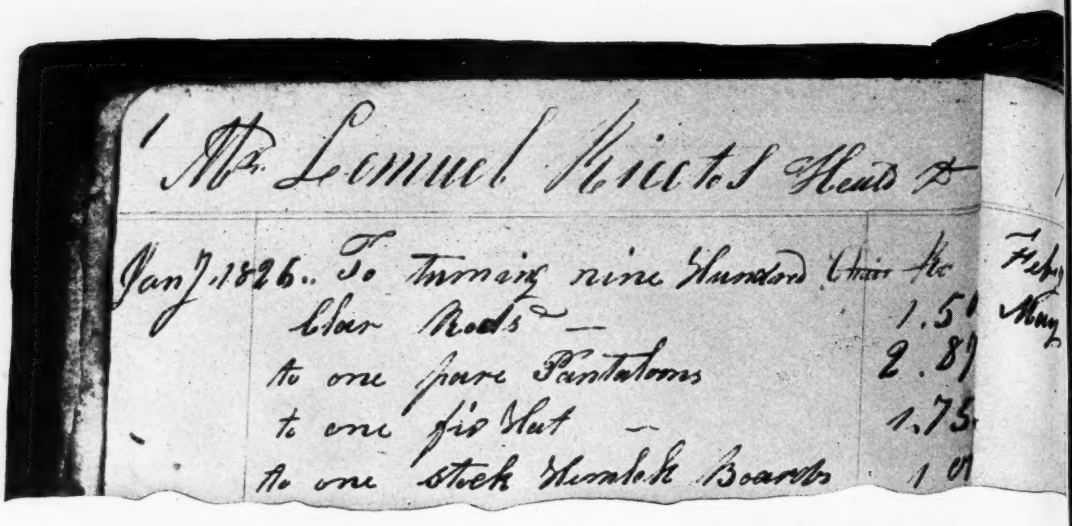
In hundreds of plants across America, Macwhyte Wire Rope Slings are standard lifting equipment. These slings are made to order to handle any type or size of load. A special braided construction, developed by Macwhyte, assures maximum flexibility and safety. For sling recommendations call a Macwhyte distributor or write to Macwhyte Company. Catalog on request.

MACWHYTE COMPANY

***2912** Fourteenth Avenue, Kenosha, Wisconsin. Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal and Stainless Steel Wire Rope. Mill depots: New York • Pittsburgh • Chicago • Minneapolis • Fort Worth • Portland • Seattle • San Francisco • Los Angeles. Distributors throughout U.S.A. carry stocks for immediate delivery.*

Member National Safety Council

For cranes and hoists use PREformed Monarch Whyte Strand Crane Rope made by Macwhyte.


Mr. Lemuel Rice to S. Heald Dr

Jan 7, 1826 .. To Turning nine Hundred Chair Rods — 1.50

to one pair Pantaloons 2.87

to one fine Hat — 1.75

to one Stock Handle Boards 1.00

YESTERDAY

Mr. Lemuel Rice to S. Heald Dr.

January 7, 1826	*To turning nine hundred chair rods*	*1.50*

This first entry, 125 years ago, in Stephen Heald's ledger marks the beginning of the business of The Heald Machine Company. Farmers for miles around depended on this man's skill and ingenuity for their ox yokes, plow beams and farming tools. He repaired their sleighs, sawed their shingles and ground their grain. He was to be followed by his son, his grandson, and his great grandsons.

Cheese presses, stoves, steam engines—sash trimmers, twist drill grinders and tool post attachments—the products changed through the years but serving the needs of the community continued.

Soon after 1900 the precision-production requirements of the automobile industry were foreseen. The Piston Ring Grinder, Cylinder Grinder and the Internal Grinder have become known the world over as distinctively "Heald." Later noteworthy developments included hydraulic table drives, automatic size control and the Bore-Matic line of precision finishing machines.

HEALD
125 YEARS

TODAY

Commerce, transportation, communication—food, clothing and shelter—all that pertains to our modern way of living depends on machine tools. They have made possible mass production and higher standards of living. Today Heald offers its best in machines and service.

TOMORROW

The record of Tomorrow awaits the future. Our Company is proud to be 125 years old. However, we know what really counts is what we will do with our background for Tomorrow. This is the beginning—not the end—of our greatest opportunity. With a deep sense of responsibility and an earnest desire to be found worthy, we face forward with confidence towards Tomorrow.

THE HEALD MACHINE COMPANY
WORCESTER 6, MASSACHUSETTS

STEEL
The Weekly Magazine of Metalworking

VOL. 129 NO. 11 SEPTEMBER 10, 1951

THIS WEEK IN METALWORKING

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Editorial and Business Staff—Page 10. Advertising Index—Page 184. Editorial index available semiannually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.

Next Week **..The U. S. Motor and Generator Industry... Improvements in Powder Metallurgy Techniques... Upside-Down Stitcher Saves Critical Steel... D.C. Synchros Control Feeds on Huge Boring Mill**

Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $20. Single copies (current issues) 50 cents. Metalworking Yearbook issue $2.00. Entered as second class matter at the postoffice in Cleveland, under the Act of March 3, 1879. Copyright 1951 by Penton Publishing Co.

Lapping Carbide 20% Faster!

Carbide spray nozzle orifices are finished to tolerances of .0005" at Spraying Systems Company, Bellwood, Illinois. New Elgin DYMO-C diamond abrasive used in place of diamond powder-oil mixture produces more pieces per hour and conserves diamond, too!

ELGIN DYMO-C*
diamond abrasives
*C FOR CARBIDE

Here is a complete new diamond abrasive specially prepared to speed carbide finishing operations. It cuts faster, won't work back on the lap, won't settle and comes ready to use without time-consuming mixing. Write for complete information—ask for a free demonstration.

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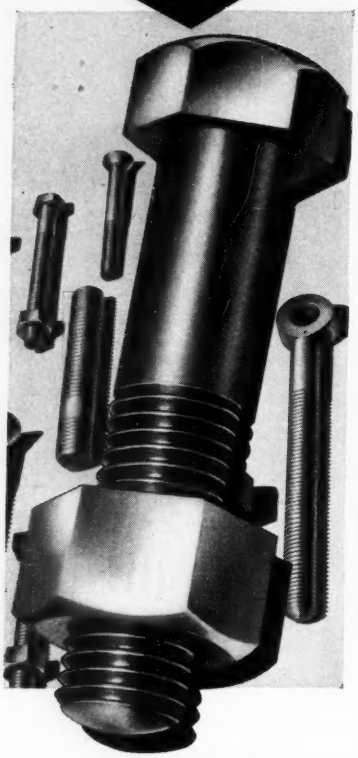
ELGIN, ILLINOIS

First for
BOLTS
NUTS
STUDS



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★ Heat-treated Alloy Steels
★ Stainless Steel
★ Silicon Bronze
★ Naval Brass
★ Monel Metal

You can count on a uniform Class 3 Fit when you buy Pawtucket threaded fasteners. Accurately made in standard dimensions — or to your specifications.

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Use Headed and Threaded Fasteners for Economy and Reliability

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THE PLACE TO SOLVE YOUR BOLT PROBLEMS
T.M. REG.

Behind the Scenes...

New Man

A new name has been added to the masthead. It belongs to Art Zimmerman, new assistant editor who will help bring you in STEEL every Monday even broader coverage of metalworking developments. Art was formerly with World Publishing Co., Cleveland, a firm that specializes in publishing Bibles. He went to Hiram College, Hiram, O., and followed up with graduate work at Western Reserve University in Cleveland.

With Art's arrival, STEEL now has a full-time editorial staff of 28 in the U.S. and nine part time correspondents scattered throughout the country. In addition, we have a London bureau plus correspondents in Canada, Latin America, Europe, South Africa, India and Australia.

Condemned

Socialist planners leave no stone unturned in their search for things to plan. A British magazine, *Individualism,* tells us that the Royal Commission on Capital Punishment spent two years studying all the intricacies of the death sentence, and came up with the fascinating suggestion that radio sets be installed in the death cells on the eve of the execution, "in which case programs would be carefully selected."

Who selects the programs? Not the miserable listener, but one of the planners. We wouldn't want to be in that planner's shoes. Should the condemned man be privileged to listen to the B.B.C.'s program on how to stuff birds, the newscasts or, in a lighter vein, an hour or so of chamber music? We could never make up our mind.

We have moved beyond the helpless delights of "the cradle to the grave" and officials now draw their salaries all the way from pregnancy to the gallows.

More Production

Just a decade ago, in the Sept. 8, 1941, issue, STEEL's Business Trend department carried the information that in the latest period available the steel ingot operating rate was 96.5, the weekly auto output was 40,000 and the weekly electric power output was 3,224 million kwh. In this week's Business Trend, which begins on page 79, all those production indexes are higher, in a period that bears some resemblance to that ten years ago. The percentage ingot rate is not so much different from that in 1941, but the capacity is far greater. The weekly auto output is about three times the 1941 rate and electric power generation has more than doubled.

The Business Trend is one of the oldest departments in the book. Its current proprietor is Assistant Editor Sam Baker. Every week he puts together figures to give you 26 indicators of the current economic activity. What's more, he writes the text in the section which carries the editorial staff's interpretations of those and other economic indicators.

Misnomer

The Joint Committee on the Economic Report has just finished a study on "Making Ends Meet on Less than $2000 a Year." The title is a misnomer, for none of the people in the case studies we read in the thing could be considered "making ends meet." All we learned was that you can, in a pinch, substitute lard for butter and get low rent if 14 people live in one room.

We think the government people need some lessons on how to write. By simply changing the title on that study to "How To Be Miserable on $2000 a Year," the writer would have adequately described what the booklet really is, a study of the abject conditions under which about 10 million families in the U. S. live.

Puzzle Corner

In the Aug. 27 problem, the coal company ended up $216.70 in the red. Robert W. Huff of Canton, O., was first in with the correct answer.

The time has come for the puzzle we carry every year about this time as the convention season starts and you metalworking people start using the hotels more frequently.

Three men enter a hotel and pay $30 for a suite. The clerk later discovers the price is $25 and gives the bell boy $5 to return to the men. The bell boy cannot divide the $5 equally among the men so he keeps $2 and gives each man $1. The men then had paid $9 each, or a total of $27 and the bell boy had $2. What became of the other $1?

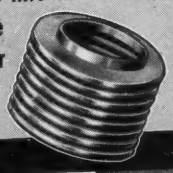
Shrdlu

(Metalworking Outlook—Page 53)

Hydraulic Deep Drawing 50% Faster

at Bridgeport Thermostat, using MULTIPRESS®

In three drawing stages—at speeds up to 1500 per hour—Multipress forms phosphor bronze discs into thin-walled tubes (left) that later become high-precision bellows (right) for thermostatic controls.



A 15-ton Multipress at Bridgeport Thermostat (Division of Robertshaw-Fulton Controls Company) Bridgeport, Connecticut

"Multipress is also 100% better on set-up and maintenance," says press foreman at Bridgeport Thermostat.

Here's more evidence that deep drawing jobs can be done faster, better and cheaper the Multipress way.

The job here is cupping and drawing phosphor bronze discs into long tubes that are later formed into intricate bellows for thermostatic controls.

With easily adjusted stroke of oil-smooth ram action plus controlled speeds and pressures, Multipress makes it possible to finish the job in fewer stages, at speeds up to 1500 draws per hour. This is 30 to 50 per cent faster than the previous mechanical press method, depending on depth of the draw.

The thin-walled tubes have to be accurate in the highest degree, as the complex folding and corrugating operations that follow must produce bellows that are uniformly sensitive to the slightest temperature changes.

Multipress also makes the operators' job easier, safer, quieter, and more pleasant. A slide feed pushes the part into the press die, and ram action is controlled by footpedal.

The Multipress, a 15-ton model, handles the job with three-ton pressure, but is also used at higher tonnages, on steel parts, with different tooling. (The dual push buttons are used on some of these job set-ups, where different safety precautions are required.)

The press foreman at Bridgeport Thermostat reports that Multipress cuts maintenance costs and sharply reduces set-up time—not only for the different draws but also in tooling the press for other operations.

Equally important gains are reported day after day by other Multipress users, on jobs that include blanking, forming, crimping, staking, punching, bending, broaching, assembling, and many others.

Multipress is available in a wide range of sizes, as shown below. Index tables; dial feed tables; harmonic stock feeds; attachments for straightening, pelleting, foil marking; and many other standard Multipress accessories are also available. If desired, Denison can design and build tooling, dies, and fixtures to meet your needs. Write today for complete information.

Multipress is built in 8 frame sizes —one to 50-ton capacities.

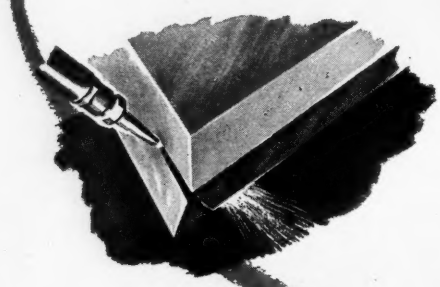
The DENISON Engineering Co.

1163 Dublin Road, Columbus 16, Ohio

DENISON HydrOILics

Imagine! Armor plate of any thickness

flame-cut to ± 1/16" Tolerance



ONLY THE ACETOGEN PROCESS OFFERS THESE STARTLING ADVANTAGES:

- Armor plate of all thicknesses flame-cut to ±1/16" tolerance!
- The flame-cut plates are ready for welding without grinding, finishing, bridging, or beading!
- Single- and multi-bevels are as easy to flame-cut as square-edges!
- Flame-cut plates have "feather" edges... surfaces have sufficiently low Brinell to allow machining!
- No heavy investment needed; the Acetogen Process utilizes standard, readily-available, low-cost equipment and tools!
- Experienced flame-cutters become qualified Acetogen operators within a few days!

AND THAT'S JUST ONE of the many amazing facts about the Acetogen Process—the only really new flame-cutting development in years!

The Acetogen Process now makes *complete* plate-edge preparation possible *with a flame!* It saves vital man-hours by eliminating most of the grinding, finishing, beading, and bridging formerly necessary. It makes *precision* flame-cutting a reality!

Acetogen Fabricators are proving these statements *today* in the Philadelphia plant of Henry Disston & Sons, Inc.—doing a job that industry thought couldn't be done. They are turning out thousands of armor plates—each one precisely cut, each one duplicating its pattern to within 1/16th of an inch! This work is a source of continual satisfaction at Disston, and Baldwin-Lima-Hamilton, where the plates are assembled.

We can produce results just as eye-opening in *your* plant. We have the gas and nozzles, and the personnel with the "know-how"; we will act either as consultants, or as sub-contractors doing the job in your plant. We invite your inquiry. Acetogen Fabricators, Inc., 822 Commercial Trust Bldg., Philadelphia 2, Pa.

ACETOGEN FABRICATORS, INC.

Originators of precision flame-cutting

New-machine accuracy from war-built Warner & Swasey turret lathes!

● This story comes from the REEVES INSTRUMENT CORPORATION of New York City, a company manufacturing precision computers and instruments. Reeves tells us that they still maintain .0005" accuracy from eight Warner & Swasey No. 3, 4, and 5 Turret Lathes purchased during World War II!

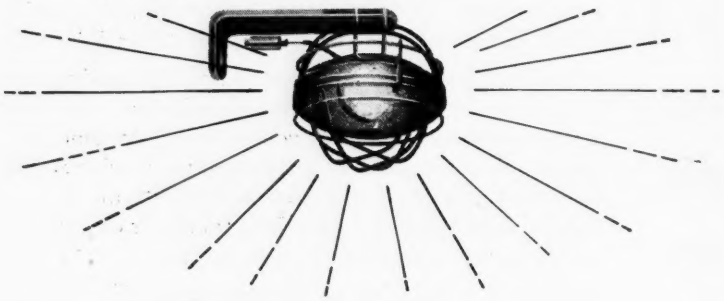
If you will recall the almost unbelievable production of machine tools in those days, it might be quite natural to think there would have been some letdown in the accuracy built into those machines. But Reeves continues to produce vital instrument parts to rigid Air Force and Navy standards of precision on their war-built Warner & Swaseys.

Today, production history is repeating itself. We're turning out machines at a tremendous rate to fill the needs of defense plants and other manufacturers. But there has been—and will be—no letdown in the accuracy and dependability that is built into all Warner & Swaseys.

Warner & Swasey Turret Lathes at Reeves Instrument Corporation, New York City

WARNER & SWASEY
Cleveland

YOU CAN MACHINE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY TURRET LATHES, AUTOMATICS AND TAPPING MACHINES



THE FIRE WATCH THAT NEVER SLEEPS

ARE you ready for fire *when* it strikes? Week ends? Nights? During shut downs? Put a Kidde Automatic Fire Extinguisher System on the job—it's *always* on the alert against fire.

The heat from a fire hits the Kidde detector ... sends a signal that releases flame-smothering carbon dioxide automatically. Such a system can protect a single space ... or many spaces throughout the plant.

Wherever a hazard exists—in engine rooms, fuel storage rooms, document vaults, electrical equipment—you can depend on fire-sensitive, fast-acting Kidde automatic or manual systems to protect your property. Call on us for full information.

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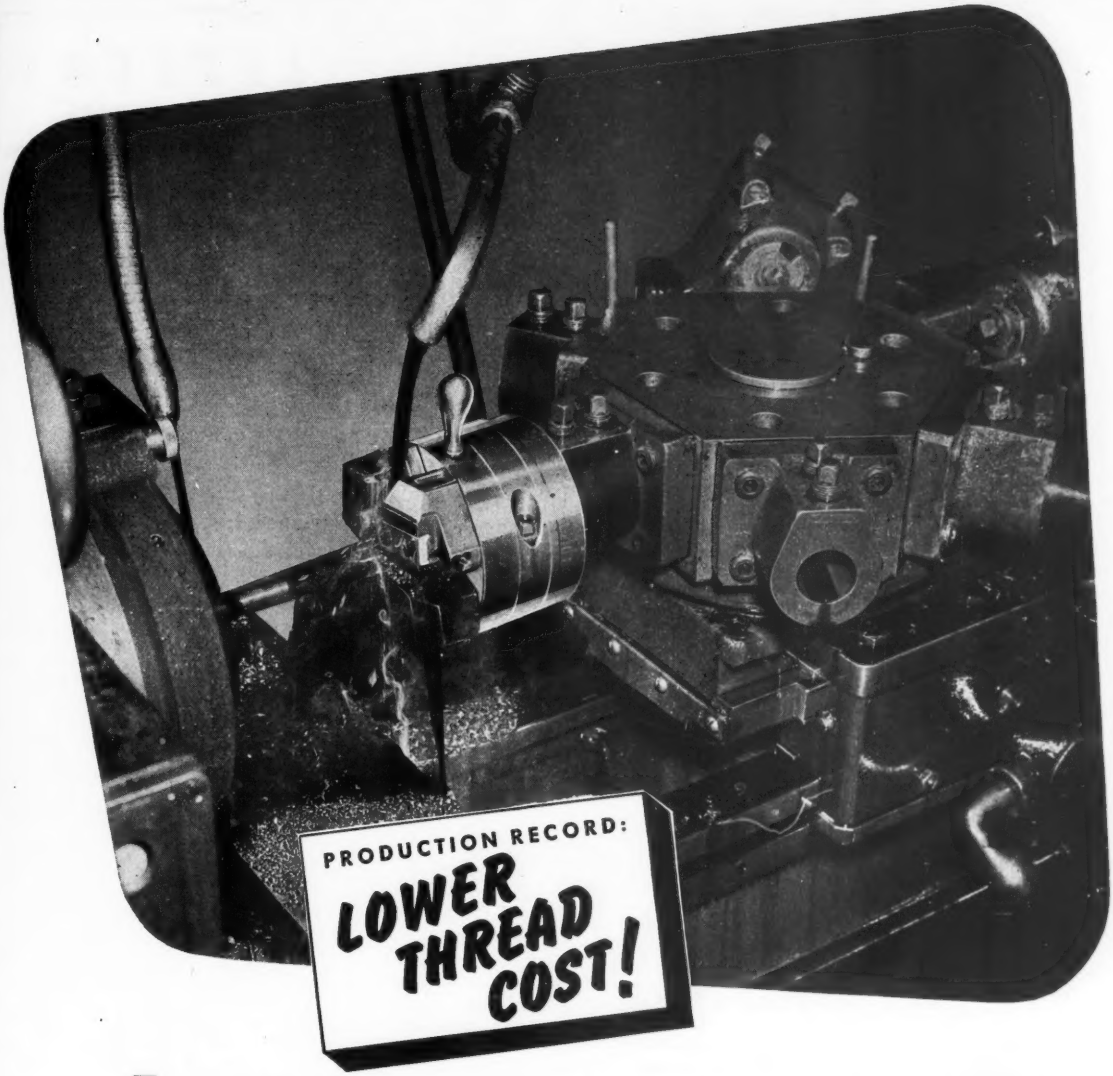


TIME Study and Methods Department records of a large aviation equipment company furnish data of another job where LANDMATIC Heads have effected large savings in machine time and improvements in product quality.

In this operation, the 1¼" LANDMATIC Head on a turret lathe equipped with Lead Screw Attachment is cutting a 5/8-6 Acme thread on a Stabilizer Screw used by a light aircraft manufacturer. The thread was held to the close tolerance of ±.001 between the P.D. of the thread and the O.D. of the screw, for a full thread length of 5-3/8" on cold-drawn piston stock, Spec. #AISI, B1112.

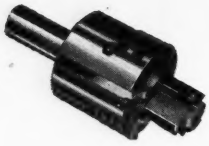
The thread is now cut in one pass in .192 minutes with a spindle speed of 230 R.P.M., giving an average of 400 pieces per chaser grind. This is a saving of approximately 75%. Former methods required two passes—one roughing and one finishing cut—and hand fitting with the mating nut was necessary in assembly.

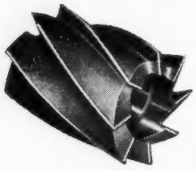
LANDMATIC Heads are stationary threading heads with self-opening action designed primarily for turret lathes. Their unusually-large oversize capacity makes them ideally suited for these machines. For detailed information and specifications, write for illustrated Bulletins F-80 and F-90.

LANDIS Machine COMPANY

WAYNESBORO • PENNSYLVANIA • U. S. A.

with *Gorham*-ENGINEERED SPECIAL CUTTING TOOLS





Next time you're up against a tough tooling problem, call in the man who can give you *the right answers fast* . . . your nearby Gorham Field Engineer! He's an expert in special cutting tools . . . and he's ready to provide a complete engineering service to determine your exact tooling requirements. He starts with your product, sketch or idea. He surveys your production operations and available equipment. He considers work material properties and desired finishes and tolerances. He plots proper machine feed, speed and method of tool driving. Then he develops practical design and engineering specifications for special cutting tools, metallurgically "tailor-made" for your application.

His recommendations are backed by Gorham's unmatched facilities, which include three fully-equipped modern plants, a large Engineering and Metallurgical staff, and a force of field application engineers in principal industrial centers, coast-to-coast. All are dedicated to furnishing prompt and profitable solutions to your special tooling problems. Gorham-engineered "specials" are turning problems into profits in thousands of plants every day . . . why not let them do the same for *you?* If you haven't met your nearby Gorham Field Engineer, write for his name, or send details of your problem direct for recommendations.

Gorham TOOL COMPANY

"EVERYTHING IN STANDARD AND SPECIAL CUTTING TOOLS"

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LETTERS
TO THE EDITORS

Report on DC Flashover

We are particularly interested in results from "flash over" on DC motors. Thus, we would like to know how to obtain the Navy Research Laboratory report on which STEEL based its item, "More Power for Motors," (Aug. 27, p. 71)

C. L. Newby, western manager
Hyatt Bearings Division
General Motors Corp.
Chicago 4

• *Write to Office of Technical Services, U. S. Department of Commerce, Washington 25. Title of the report is PB 102 598, Flashing of DC Machines Caused by Short Circuits.*

Engineers: A More Efficient Plan

The supply of engineers and technical personnel available to industry has been inadequate for several months. STEEL's article, "Engineers: A More Efficient Use," (Aug. 20, p. 49) indicates the government is finally aware of this situation . . . and is making a belated attempt to utilize these men to greater advantage.

The stimulation of enrollments in engineering schools is necessary to maintain an adequate supply of new engineers. However, the effects will not be felt for at least three years.

Steps taken to relieve the immediate shortage would have been much more effective had they been initiated at the start of the selective service program. Now, most trained technical personnel of draft age have already been inducted into the Army. Employers' efforts to gain deferment for such men were unsuccessful since there was no provision for deferring essential engineers in private industry.

As a result of this short-sighted attitude, the Army has many engineers in jobs that could be handled by men with less training or jobs that could be eliminated.

I believe steps should be taken to determine whether drafted engineers are more valuable in present capacities than in their former jobs. If not, they could be returned to their positions in defense industry. In addition, engineers now in the Army who were not employed previously in defense industry, might be more valuable if they were allowed to take defense jobs now.

In my opinion, a plan of this kind would do much more to satisfy the immediate demand than the program outlined by the Department of Labor.

Pfc. Earl W. Sherburne
9361st TSU, Red River Arsenal
Texarkana, Tex.

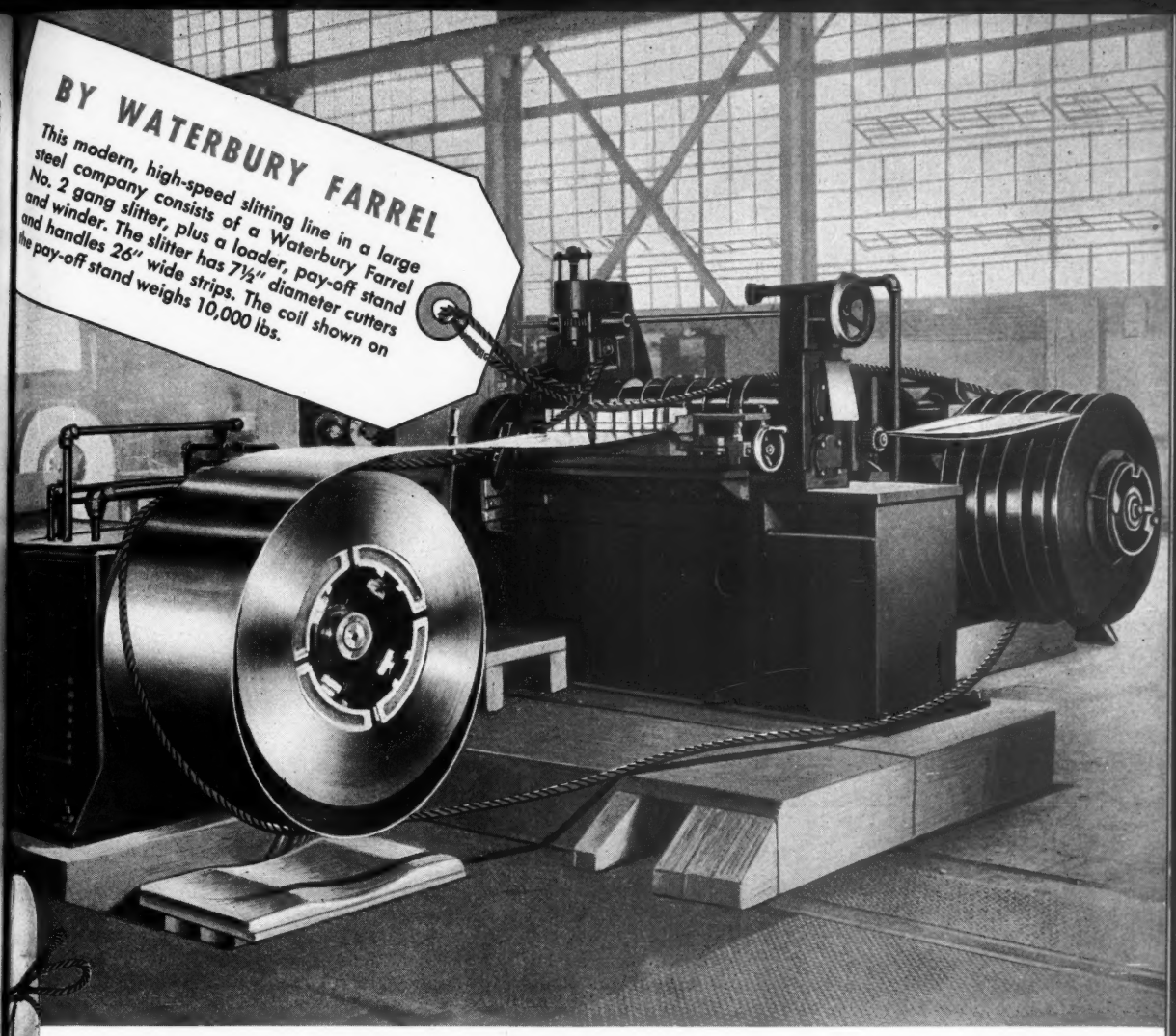
• *Amen!*

Increasing Surface Hardness

Are reprints available for the article by W. J. Rietze, titled "High Speed Quenching Oils Increase Surface Hardness?" (STEEL, June 18, p. 72)

E. A. Hill, production engineer
The Palnut Co.
Irvington, N. J.

• *Reprints are available and copies have been forwarded.*


BY WATERBURY FARREL
This modern, high-speed slitting line in a large steel company consists of a Waterbury Farrel No. 2 gang slitter, plus a loader, pay-off stand and winder. The slitter has 7½" diameter cutters and handles 26" wide strips. The coil shown on the pay-off stand weighs 10,000 lbs.

nember this:

WHEN YOU NEED A MODERN ANSWER TO SPECIFIC SLITTING REQUIREMENTS

Many manufacturers are finding that slitting their own strip pays in time and dollars.

From Waterbury Farrel you can get modern, high-speed slitting machines fitted by type, size and accessory equipment to your specific requirements.

There are six standard sizes of Waterbury Farrel gang slitters capable of handling a wide range of gauges and widths. Accessory equipment such as loaders, pay-off stands, winders, coilers, backrolls, scrap cutters etc., are available to make the entire slitting set-up a Waterbury-Farrel "package".

Special attachments can be "engineered-in" when necessary to adapt the slitters to special applications.

Phone, write or wire for complete information.

WATERBURY FARREL FOUNDRY & MACHINE COMPANY

WATERBURY, CONNECTICUT, U. S. A. • *Sales Offices:* Chicago, Cleveland and Newark

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A FEW OF THE MANY TYPES OF METAL WORKING MACHINERY MADE BY WATERBURY FARREL

PROCESS BOLT AND NUT MACHINERY — Headers (all types) • Re-headers • Trimmers • Thread Rolling ...ers • Slotters • Nut Tappers, etc. POWER PRESSES — Crank • Cam and Toggle; also Rack and Pinion Presses ...er Presses • Multiple Plunger Presses including Horizontal Drawing Presses and Eyelet Machines; Hydraulic ...s, etc. MILL MACHINERY — Rolling Mills • Wire Flattening Mills, Chain Draw Benches • also Slitters ...teners • Pointers • Swagers • Cut-off Saws • Coilers • Winders and related equipment. WIRE MILL ...IGNT — Continuous Fine Wire Drawing Machines • including Upright Cone and Tandem Wire Drawing Machines • Bull Blocks • String-up Machines • Spoolers, etc.

FOUNDED WATERBURY FARREL 1851

In Equipment, Experience Counts
We're 100 in '51!

• • • • Every steel man knows this picture. He knows that the open hearth has made possible steel's magnificent contribution to America's industrial growth...our amazingly high standard of living. And he knows that steel production stands as our first line of defense in today's troubled world.

The refractory industry has kept pace with steel by producing refractories that last longer . . . stand higher heats . . . are available in adequate quantities. General Refractories is proud of its part in this task of serving steel.

Inside this furnace you may find

The Inside Story

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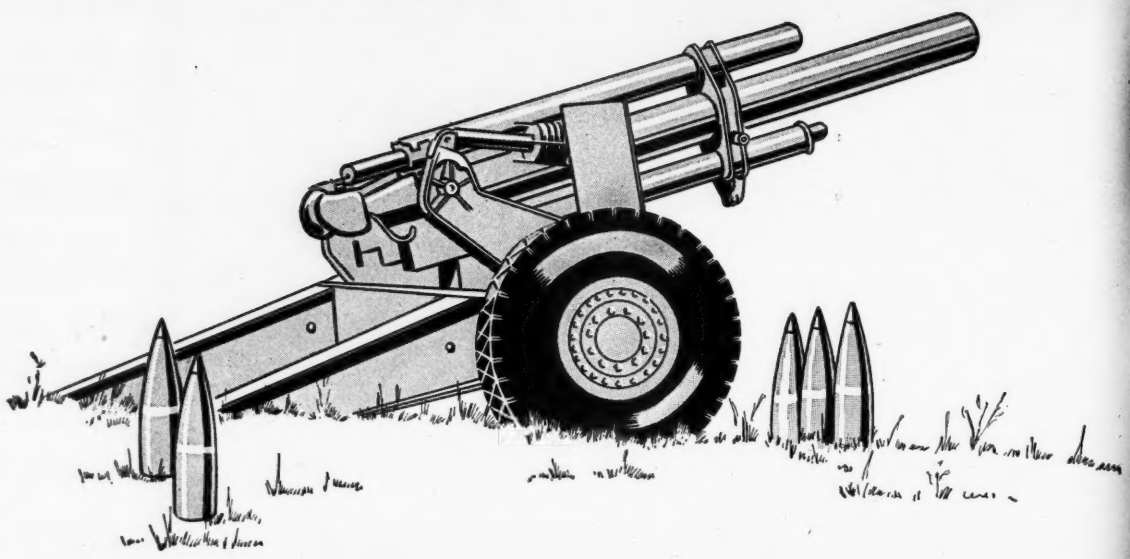
GENERAL REFRACTORIES COMPANY
PHILADELPHIA

RITEX C and RITEX A Basic brick, STEELKLAD brick, General's Silica and Fireclay brick. But throughout the plant you'll find many another General product scientifically designed and produced to do the particular job at hand.

General offers the steel industry exhaustive research facilities, modern production methods, skilled personnel. General's 43 mines, 29 plants, 18 sales offices and more than 200 distributing agencies are strategically located throughout the nation and abroad. In short, General offers you a complete refractories service!

A Complete Refractories Service



Blasting an old-fashioned coolant idea!

More and more machinists are cutting coolant costs and improving production by using Houghton *Antisep* "across the board". They're finding this all-purpose base covers better than 90% of their metal-cutting jobs. They're convinced it's getting old-fashioned to use a different coolant for every operation in the shop.

You'll use Antisep for general machine work . . . for automatics . . . for stamping and forming. You'll handle one instead of many cutting oils. You'll save space, write smaller inventories, simplify selection. Two good examples of precision machining with Antisep All-Purpose Base are given here.

Ask the Houghton Man to show you how Antisep can be used as coolant and die lubricant over many operations. Or write E. F. Houghton & Co., Philadelphia 33, Pa., for full information and prices.

TWO GOOD EXAMPLES OF ANTISEP'S DEFENSE APPLICATIONS

One well-known plant machining shells is using Antisep to 25 parts water in:

1. Rough turning
2. Semi-finish turning
3. Machining nose
4. Shell body turning and finishing
5. Cutting off center boss
6. Cutting and finishing recess band groove

In machining of 15-ft. 90 mm guns, another plant performs the following operations using Antisep mixed with water in proportions shown:

1. Reaming (1 to 20)
2. Machining powder chamber (1 to 15)
3. Machining breech end (1 to 30)
4. Machining muzzle end (1 to 30)

ANTISEP

ALL-PURPOSE BASE

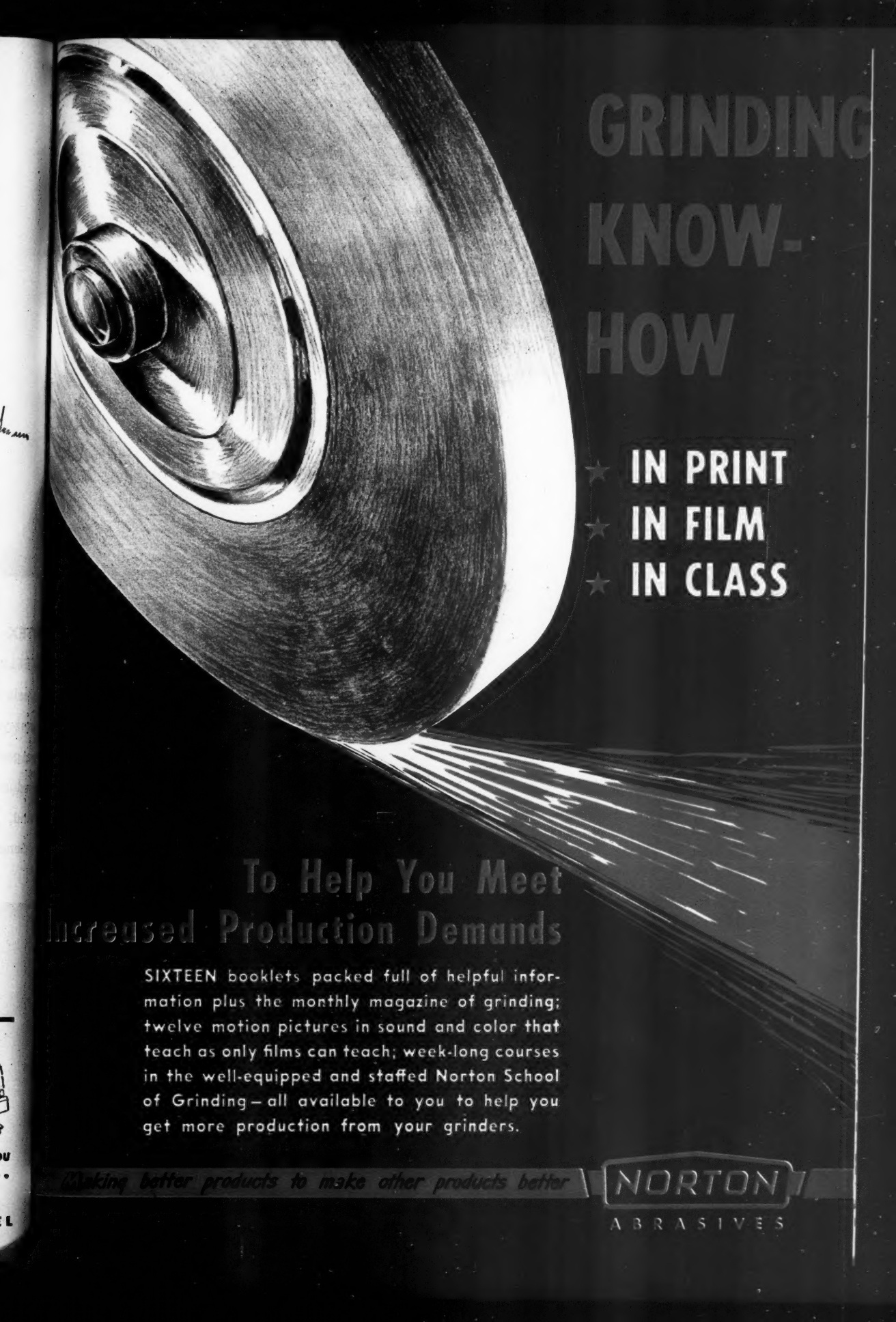
HIGH IN ANTIWELDING PROPERTIES AND FATTY CONTENT

E. F. HOUGHTON & CO.

PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service . . .

LATEST BULLETIN
on Houghton Antisep—showing its versatile applications—will be mailed on request.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SIXTEEN booklets packed full of helpful information plus the monthly magazine of grinding; twelve motion pictures in sound and color that teach as only films can teach; week-long courses in the well-equipped and staffed Norton School of Grinding—all available to you to help you get more production from your grinders.
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"LESSONS IN GRINDING"

. . . A Series of Motion Pictures with Sound and Color

"Lessons in Grinding" is the title of a series of eight Norton Motion Picture Films which are available to industrial apprentice schools, vocational schools, and all other classes where machine shop practice is being taught. These films present the fundamentals of grinding in a way that the inexperienced man can understand.

"CUTTER SHARPENING"—It teaches the principles of tool room grinding and illustrates typical set-ups.

"THE CYLINDRICAL GRINDER"—The fundamentals of operating a cylindrical grinder are shown and the importance of precision.

"THE SURFACE GRINDER"—The preparation, operation and care of a surface grinder are described. No minor detail is omitted.

"THE GRINDING WHEEL, ITS CARE AND USE"—Subjects such as mounting, balancing, truing, dressing and safety are handled pictorially.

"GRINDING CARBIDE TOOLS"—A new and revised film showing the correct methods of grinding carbide tipped tools.

"THE DIAMOND WHEEL, ITS CARE AND USE"—A new film on the proper handling and care of diamond wheels.

"GRINDING WHEEL MARKINGS"—It clarifies a typical grinding wheel marking, explaining the meaning of each symbol.

"GRINDING WHEEL SAFETY"—It shows the most critical factors in the handling of grinding wheels and the more common causes of wheel breakage.

All Norton films are loaned without charge; all are 16 mm. sound on film.

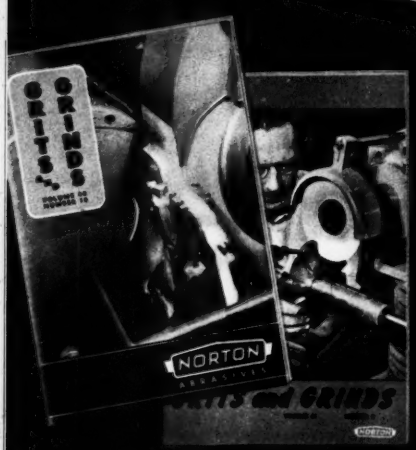
SCHOOL OF GRINDING

. . . Practical Instruction for Grinding Foremen and Supervisors

A one-week course of visual and oral instruction at the Norton plant is available for grinding department and tool room foremen and assistants, apprentice instructors, and the like. Conducted in the new, well-equipped Norton School of Grinding, this course gives intelligent instruction in the selection and operation of grinding wheels and other abrasive products.

Instruction by a skilled, full-time staff is supplemented with round-table discussions by research laboratory specialists and grinding engineers.

For arrangements and particulars write to Norton Company, Educational Department, Worcester 6, Mass.



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For forty years this Norton technical magazine has been the recognized authority on grinding. Twelve times a year it brings you articles by Norton engineering experts on how to do your grinding, lapping and polishing jobs better and more economically.

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. . . Pages and Pages of Production-Boosting Information

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Sent free on request—no obligation.

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LINK-BELT has worked hand-in-hand with America's manufacturers since 1875 to step up production

PRODUCTION-MINDED engineers were quick to recognize there's no such thing as an "all-purpose" chain. Link-Belt offers the *right* chain for every job—from the world's most complete chain line. That's why you see more Link-Belt Chain throughout industry than any other make.

As an example, when one company recently put out a new model, Link-Belt specialists worked with the firm's engineers in the field . . . actually quadrupled the life of the main drive.

By supplying the correct type of chain for each specialized requirement, Link-Belt increases design flexibility . . . lengthens chain life while reducing maintenance . . . actually steps up production in many cases.

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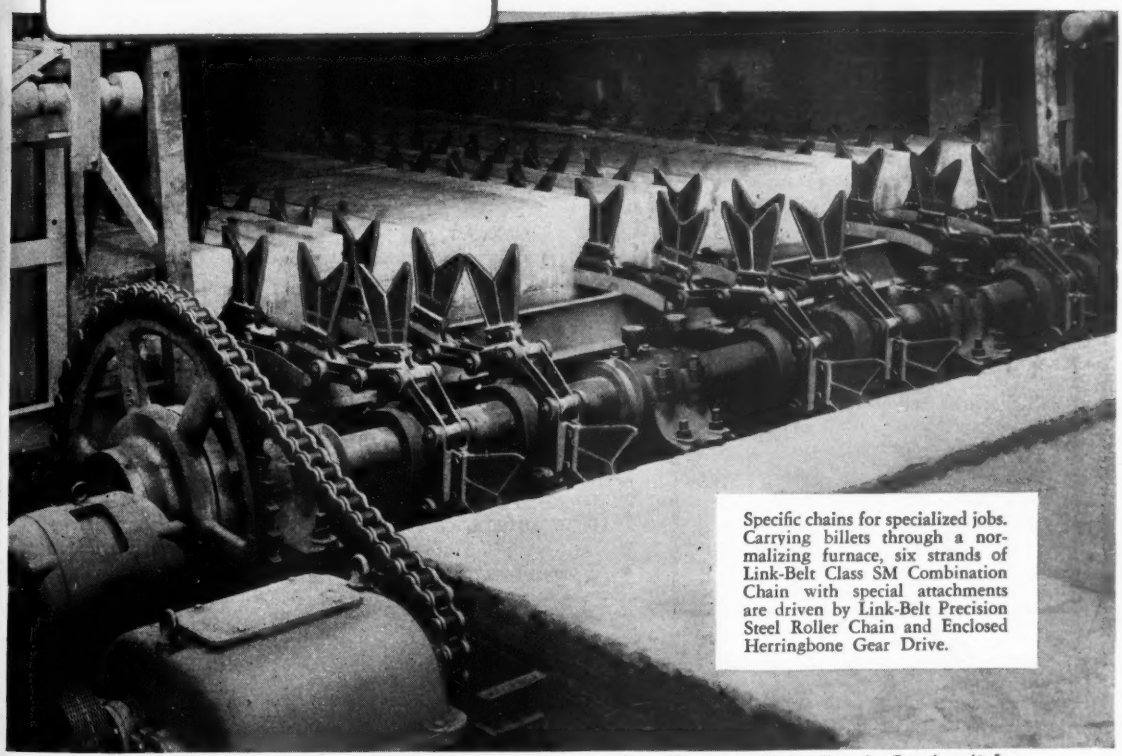

Specific chains for specialized jobs. Carrying billets through a normalizing furnace, six strands of Link-Belt Class SM Combination Chain with special attachments are driven by Link-Belt Precision Steel Roller Chain and Enclosed Herringbone Gear Drive.

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 42, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices in principal cities. 12,422

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ELIMINATE THE GRINDING OPERATION ON YOUR STEEL BARS WITH

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STRESSPROOF PROVIDES 4 QUALITIES IN 1 BAR

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Its *in-the-bar* strength, as received, is twice as great as ordinary cold-finished steel shafting.

2. Eliminates Case Hardening

Its resistance to wear, as machined, is sufficient to replace many heat-treated or carburized steels.

3. Minimizes Warpage

Because it is *stress-relieved*, this superior bar assures the user a minimum of distortion.

4. Speeds Up Machining

Has *in-the-bar* machinability fully 50% better than heat-treated alloys of the same hardness.

Many companies are realizing important savings by using Ground and Polished STRESSPROOF bars instead of grinding the steel in their own shop. For this superior steel provides precision tolerances at a reasonable cost, without tying up valuable labor and machinery.

This all-purpose bar stock is ground to close tolerance and highly polished at the LaSalle plant on batteries of modern machines — at lower cost than you can grind it yourself. Furthermore, because this versatile steel is stress-relieved, it requires no straightening after keyseating, journaling, threading, or other machining operations. And its four qualities in-the-bar eliminate many other costly operations.

Almost all of today's Ground and Polished STRESSPROOF production is going into defense jobs. However, from time to time, some sizes of sample bars may be available for testing purposes.

LaSalle STEEL CO.

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Manufacturer of the Most Complete Line of Carbon and Alloy Cold-Finished and Ground and Polished Bars in America

ANOTHER DIE CAST PRODUCT MADE BETTER ON KUX DIE CASTING EQUIPMENT

To Make a Better
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AUTOMATIC PENCIL
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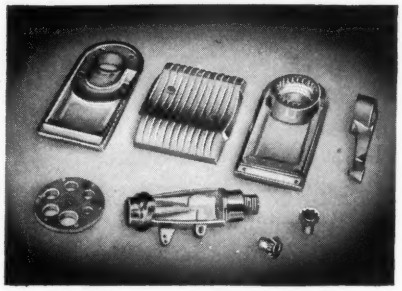
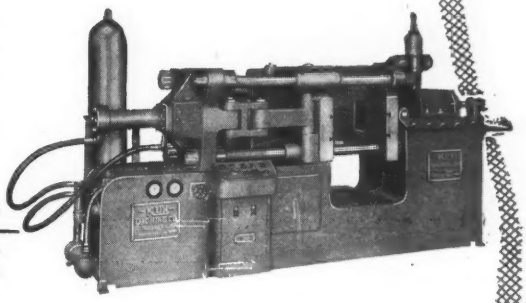


In designing their new Dexter model, the Automatic Pencil Sharpener Company considered appearance, performance and production of equal importance. To assure results as outstanding as the deluxe new Dexter has proved to be, Automatic chose KUX die casting equipment.

The exacting specifications demanded for superior die castings of the sharpener's base and uprights as well as internal mechanical parts, handle, and centering disc—a total of eight die castings—made the selection of KUX a natural one. Substantial economies of production resulting from the use of KUX machines offered further advantages.

Why not give your product the benefit of such economies and improved die casting techniques?



MODEL **BH-30** ILLUSTRATED

Hydraulically operated die casting Machine for production of lead, tin and zinc castings up to 10 pounds.

Write today for illustrated catalog showing complete line of KUX Die Casting Machines.

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YOU don't have to be connected with the process industries to know that many details of chemical processing are vital and closely-held secrets. But it's no secret that a very large share of this production, whether hush-hush or not, is conducted in equipment made of stainless steel—for the excellent reason that stainless steel is the *one* material that best meets the need for great strength and high resistance to corrosion, heat and wear.

Put it this way: Allegheny Metal equipment gets the call because stainless steel lasts longer, looks better, cleans easier and quicker, maintains top purity standards and holds maintenance and depreciation costs down to the bottom.

That's why Allegheny Metal is a highly essential material, especially in time of national need. We've spent (and are spending) many millions of dollars to increase our production, but it is still necessary to make every ton of stainless steel go as far as possible. ● Let our engineers help you *to use* Allegheny Metal and other alloy steels to the best advantage.

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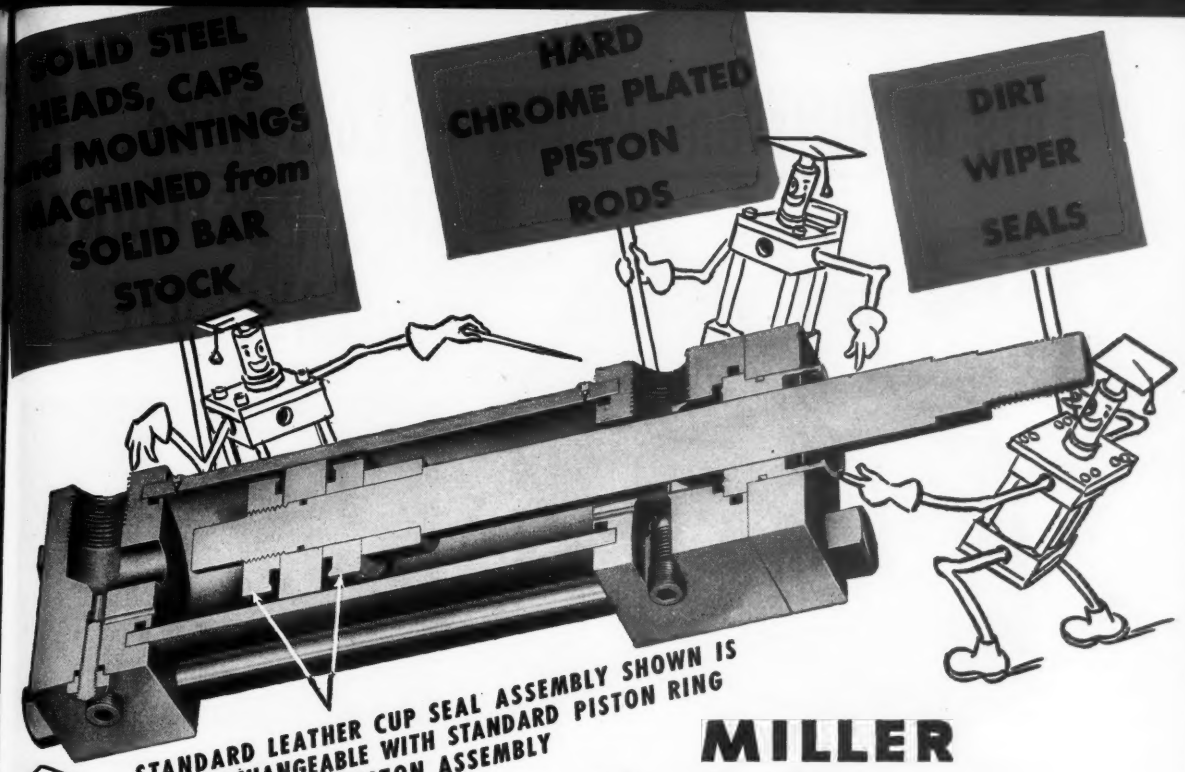

STANDARD LEATHER CUP SEAL ASSEMBLY SHOWN IS INTERCHANGEABLE WITH STANDARD PISTON RING PISTON ASSEMBLY

MILLER

High Pressure

HYDRAULIC CYLINDERS

Meet J. I. C. HYDRAULIC STANDARDS

(Write for FREE copy of these "Standards")

Years before the Joint Industry Conference (J. I. C.) Standards for specifying "quality" hydraulic equipment were adopted, the *standard* design and construction features of Miller High Pressure Hydraulic (2000-3500 psi) Cylinders already included ALL the specifications for cylinders, seals and pistons now called for by the "Standards". Hard chrome plated, scratch-resistant piston rods and dirt wipers have long been standard Miller cylinder features yet are required by the "Standards" only under severe conditions.

Solid steel heads, caps and mountings which eliminate costly, dangerous breakage even under the severest operating conditions represent an "extra-quality" standard Miller cylinder feature which actually exceeds the high quality set by the J. I. C. Standards.

The Miller "Patented" Hydraulic Piston Rod Seal which has no manual adjustment and is automatically self-adjusting and wear-compensating to give life-long leakproof service without ever requiring any manual adjustment whatsoever . . . far surpasses the requirement of J. I. C. Standard H6.2.5 which specifies "Stuffing boxes for automatic packing shall be so designed as to prevent adjustment beyond the functional limits of the packing"

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Benefits to You

No Broken Castings

No Scratch-Damage to Piston Rods, Bushings and Seals

NO COSTLY "DOWNTIME"

NO REPAIRS

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NO POWER WASTAGE

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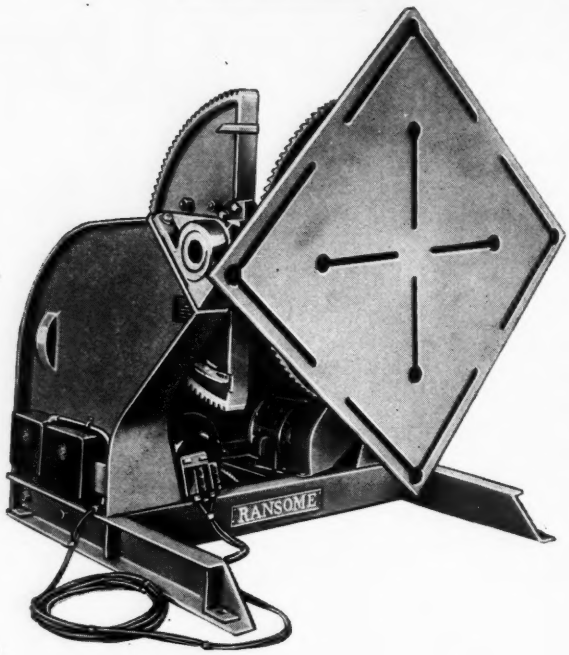
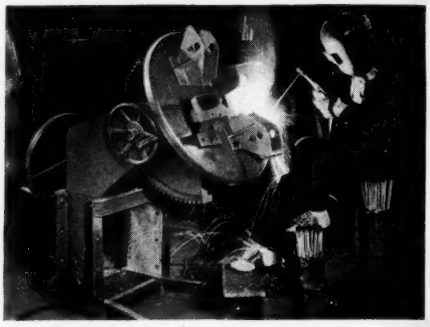
Sales and Service from coast to coast

Lots of Different Pieces or Lots Alike...

THIS POSITIONER PAYS OFF





in more production . . . better welds . . . less rod waste

The universal table top makes the Worthington-Ransome Welding Positioner as profitable on *job* work as it is in mass production. Those "T" slots make the table adaptable to any shape of work piece and a wide range of sizes. No special jigs or fixtures needed.

Whether you produce "thousands alike" or "every one different", benefit from *increased arc-time* with Worthington-Ransome Welding Positioners. With just one set-up, the work is clamped to the table top. Then push-button controls or simple hand cranks do the work of tilting or rotating into any position convenient for economical downhand welding. Your welder can continuously weld without costly time and labor wasted in frequent rehandling of the work.

Result—up to 50% more footage, *better* welds (using higher current and heavier rods), less welding rod waste.

Welding positioner capacities from 100 lb to 30 tons. Also: turning rolls from 3 to 150 tons, stationary or self-propelled.

Write Worthington Pump and Machinery Corporation, Dunellen, New Jersey, for bulletins or additional information.

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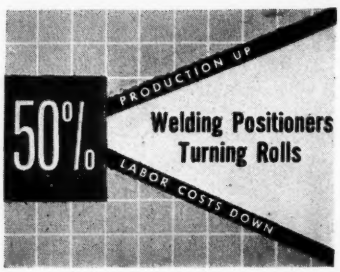
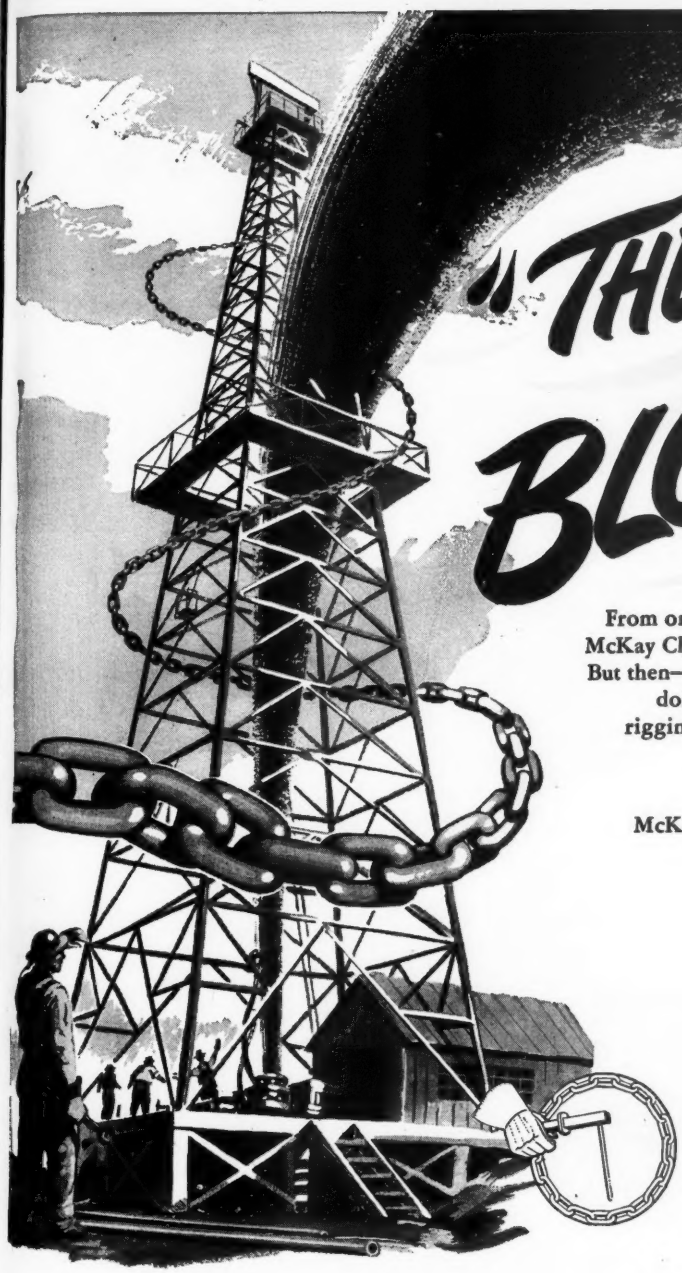
WORTHINGTON





"THERE SHE BLOWS"

From one end of the oil country to the other, McKay Chain is at work helping hit pay sands. But then—you'll find McKay Chain everywhere doing the useful jobs of lifting, hauling, rigging, tying, spinning and other material and power transfer applications.

In every industry—there is a McKAY CHAIN FOR EVERY USE . . . no job is too big, none too small!

McKAY CHAIN BULLETINS
- Sling Chain
- General-Purpose Chain
- Oil Country Chain
- Tractor-Truck Chain

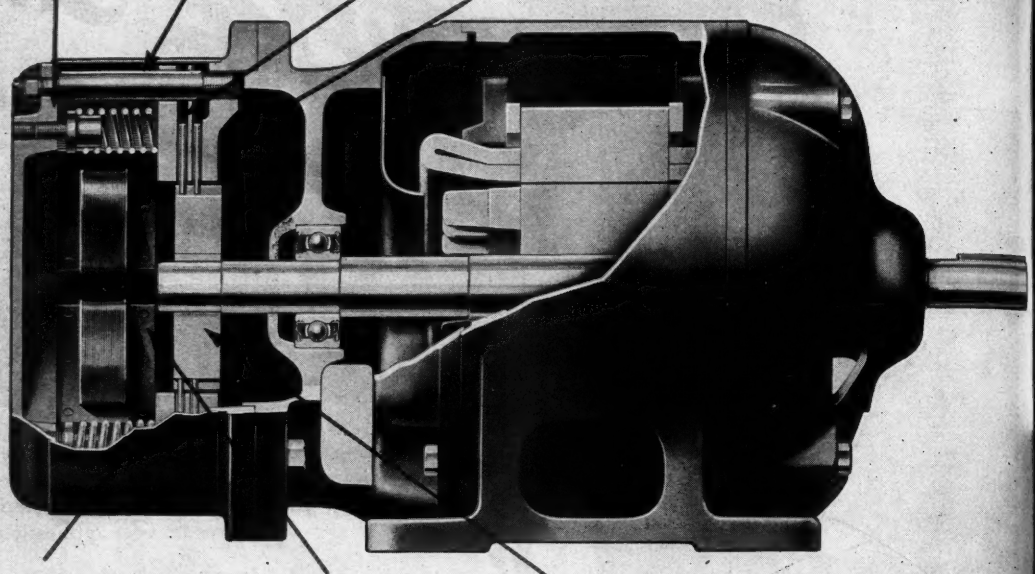
Write for the bulletins you need.

McKAY CHAIN
for Every Use

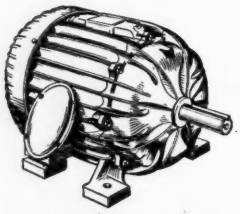
McKAY—A GOOD NAME FOR GOOD CHAIN—SINCE 1881

The McKAY Company • 446 McKay Building • Pittsburgh 22, Pennsylvania

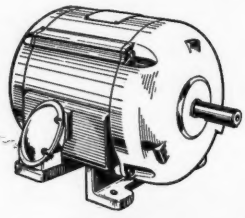
Here's ab


Oversize brake studs absorb torque.
Magnet armature plate.
Readily accessible torque adjusting screws.
All-metal brake disc.
Wrap-around band cover, for totally-enclosed protection and easy removal.
Core plated "E" magnets. Readily accessible. Location keeps heat away from motor.
Large brake spline with many teeth.

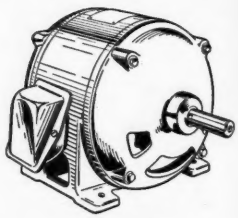
Other ELLIOTT C-W motors for special and general use . . .



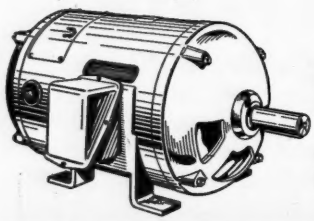
TYPE CFC
Squirrel cage, "Sealed Power," Totally-Enclosed, Fan-cooled



TYPE BE
Squirrel cage, Totally-Enclosed, Non-Ventilated



TYPE BA
Squirrel cage, open-drip-proof (protected)



TYPE BW
Wound rotor, Open-drip-proof (protected)

Other Elliott products include: Turbine-Generators • Deaerating Heaters • Generators • Turbochargers • Strainers • Centrifugal Blowers • Condensers • Mechanical Drive Turbines • Steam Jet Ejectors and Tube Cleaners.

ELLIOTT COMPANY

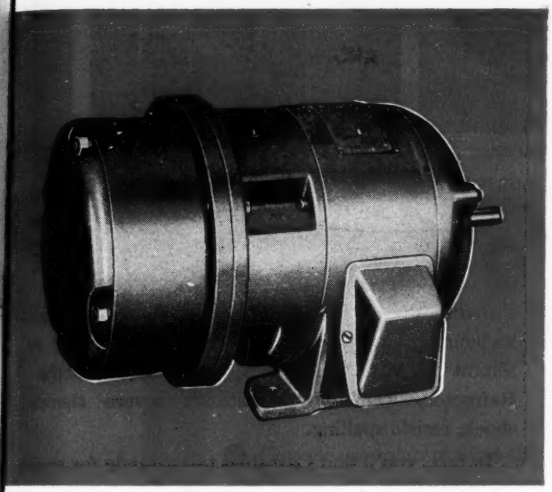
General Offices & Main Plant—Jeannette, Pa.

a brake that can take it!

The Elliott CROCKER-WHEELER BRAKE MOTOR

QUICK STOPS AND STARTS are taken in every day stride by this rugged brake motor. Its all-metal *bonded* brake linings dissipate heat faster, wear longer and are immune to dampness, cold and other "brake killers." In performance, the powerful magnetic braking action is instantaneous—and sure.

Moreover, the Elliott C-W brake is tops in compactness and adaptability. It can be mounted on double shaft extension NEMA standard D flange or C face motors without the need of mounting brackets or adapters. Teamed with an efficient Elliott C-W motor (protected or totally-enclosed types), it's a combination that's hard to match.



The Elliott C-W Brake-Motor. Note the simple, wrap-around cover on the brake to give totally-enclosed protection.

SEND FOR THIS BULLETIN

It gives you all the details of construction and applications. Ask for BRAKE MOTOR BULLETIN SL-610-1 and address your request to Elliott Co., Dept. P.E., Jeannette, Pa.

ELLIOTT C-W motors range from 1 to 200 hp. Large ELLIOTT motors and generators are built by the RIDGWAY DIVISION in Ridgway, Pa.

CW-23

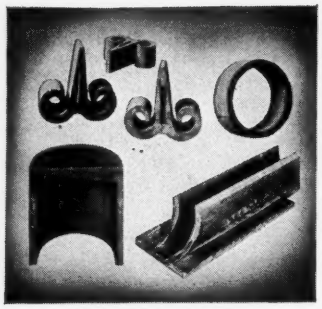
CROCKER-WHEELER DIVISION
AMPERE, N. J.

BRANCH OFFICES AND REPRESENTATIVES IN PRINCIPAL CITIES
ELLIOTT *Approved* SERVICE SHOPS COVER THE COUNTRY

HALF CENTURY OF 1901 Elliott Co. 1951 POWER PROGRESS

Here's the most convenient way to make Refractory Concrete:

★ CAR TOPS
★ ARCHES ★ HEARTHS



★ SPECIAL SHAPES
★ CORE OVEN FLOORS

★ HEAT TREATING FURNACES
★ DOOR LININGS

IT'S THAT SIMPLE—Castable Refractories completely eliminate the need of finding suitable aggregates . . . and grading them to the right sizes. Packaged Castables come to you with Lumnite* calcium-aluminate cement and selected aggregates already mixed—needing only addition of water. The resulting Refractory Concrete reaches service strength in 24 hours or less.

This convenient way of making Refractory Concrete speeds work and cuts labor costs. It simplifies tough jobs—and some Castables are suitable for use at temperatures of 3000°F. or higher.

REFRACTORY CONCRETE made with Castables is the *adaptable* refractory. Easy to place in any size or shape.

No cutting or fitting necessary when you pour furnace walls, door linings and special shapes. There's no volume change to bother about. Build heat resistant floors, furnace walls, arches and hearths—Refractory Concrete withstands severe thermal shock, resists spalling.

In fact, you'll find Castables tailor-made for speed and convenience on many Refractory Concrete jobs. Handy for repairs, too.

CASTABLES to meet specific temperature and *insulation* requirements are made by manufacturers of refractories and sold by their distributors. For further information, write to LUMNITE DIVISION, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

**"LUMNITE" is the registered trade mark of the calcium-aluminate cement manufactured by Universal Atlas Cement Company.*

S-L-54

ATLAS® LUMNITE for INDUSTRIAL CONCRETES

REFRACTORY, INSULATING, OVERNIGHT, CORROSION-RESISTANT

A UNIVERSAL ATLAS PRODUCT

"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—NBC Network*

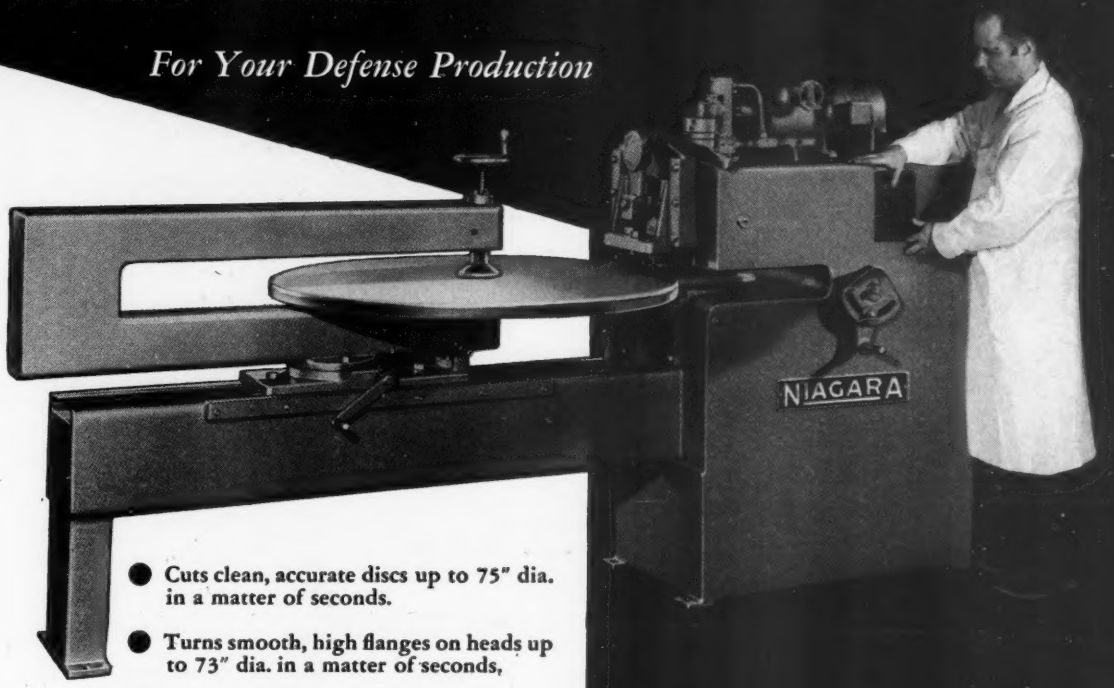
NIAGARA

ANNOUNCES A NEW

Model 8-8 Hi-Production

CIRCLE SHEAR AND FLANGER

For Your Defense Production



- **Cuts clean, accurate discs up to 75" dia. in a matter of seconds.**
- **Turns smooth, high flanges on heads up to 73" dia. in a matter of seconds.**
- **Capacity up to 8 ga. mild steel, 12 ga. stainless steel.**
- **Minimum investment in machine and tools for hi-production of a vast size range of discs and heads.**
- **Fast set up for either circle shearing or flanging operation.**

- Ideally adapted for either high or low and even single quantity production.
- Effortless push button control with new automatic feeding cycle.
- Variable Speed Power Flanging Feed lowers and raises upper flanging roll at optimum speed for ideal flanging. Operator can dial to proper feed rate to suit thickness of material.
- Unbreakable steel construction throughout.

Write for Bulletin 86

NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, NEW YORK

Manufacturers of America's Most Complete Line of Presses, Shears, Machines and Tools for Plate and Sheet Metal Work

DISTRICT OFFICES: DETROIT • CLEVELAND • NEW YORK

FOUNDRIES NEED SCRAP - - KEEP IT MOVING!

Gear your product to... GRAY IRON'S ADVANTAGES

These helical gears illustrate several of Gray Iron's important advantages:

Wear Resistance . . . Gray Iron's strength and freedom from distortion, insure long life in metal-to-metal wear service.

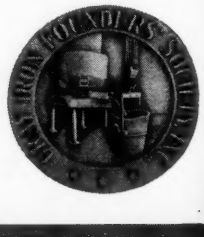
Machinability . . . Gear teeth and other contact surfaces are easily machined to a high, mirror-like finish—reducing friction.

Lubricating Action . . . Gray Iron's graphite structure helps to protect against seizure or scoring of the part, even with failure of the lubricating system.

Readily Heat-treated . . . Gray Iron responds to flame hardening, induction hardening and other heat treatments. Wear resistance can be increased up to many times that of the as-cast material.

Why not gear *your* product to Gray Iron's unique combination of advantages? You'll find it pays.

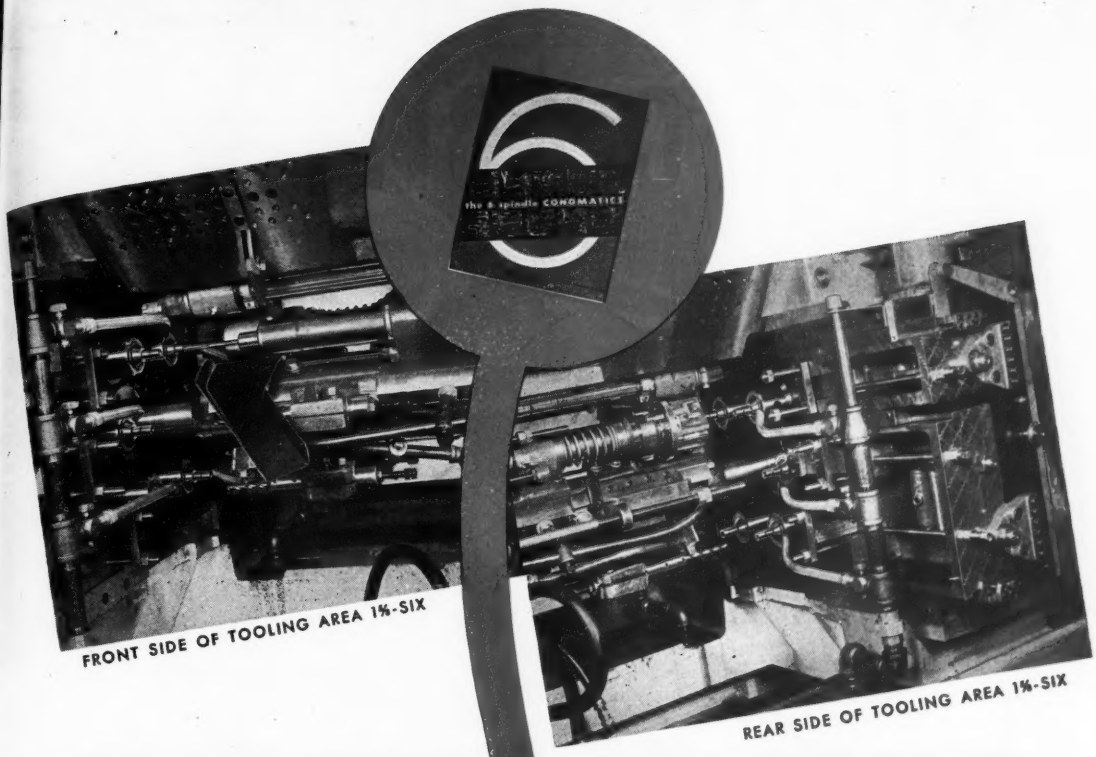
- Castability
- Rigidity
- Low Notch Sensitivity
- Wear Resistance
- Heat Resistance
- Corrosion Resistance
- Durability
- Vibration Absorption
- Machinability
- Wide Strength Range



MAKE IT BETTER WITH GRAY IRON—Second largest industry in the Metal-working field

GRAY IRON FOUNDERS' SOCIETY, INC.

NATIONAL CITY-E. 6th BLDG., CLEVELAND 14, OHIO



FRONT SIDE OF TOOLING AREA 1⅛-SIX

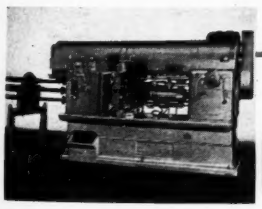
REAR SIDE OF TOOLING AREA 1⅛-SIX

THE IMPORTANT REQUIREMENT

All brands of multiple spindle bar automatics offer value or they would not be on the market. If it were possible to engineer and incorporate the superior qualities of all into one machine, certain features would still be considered more important than others in accordance with the individual buyer's requirements.

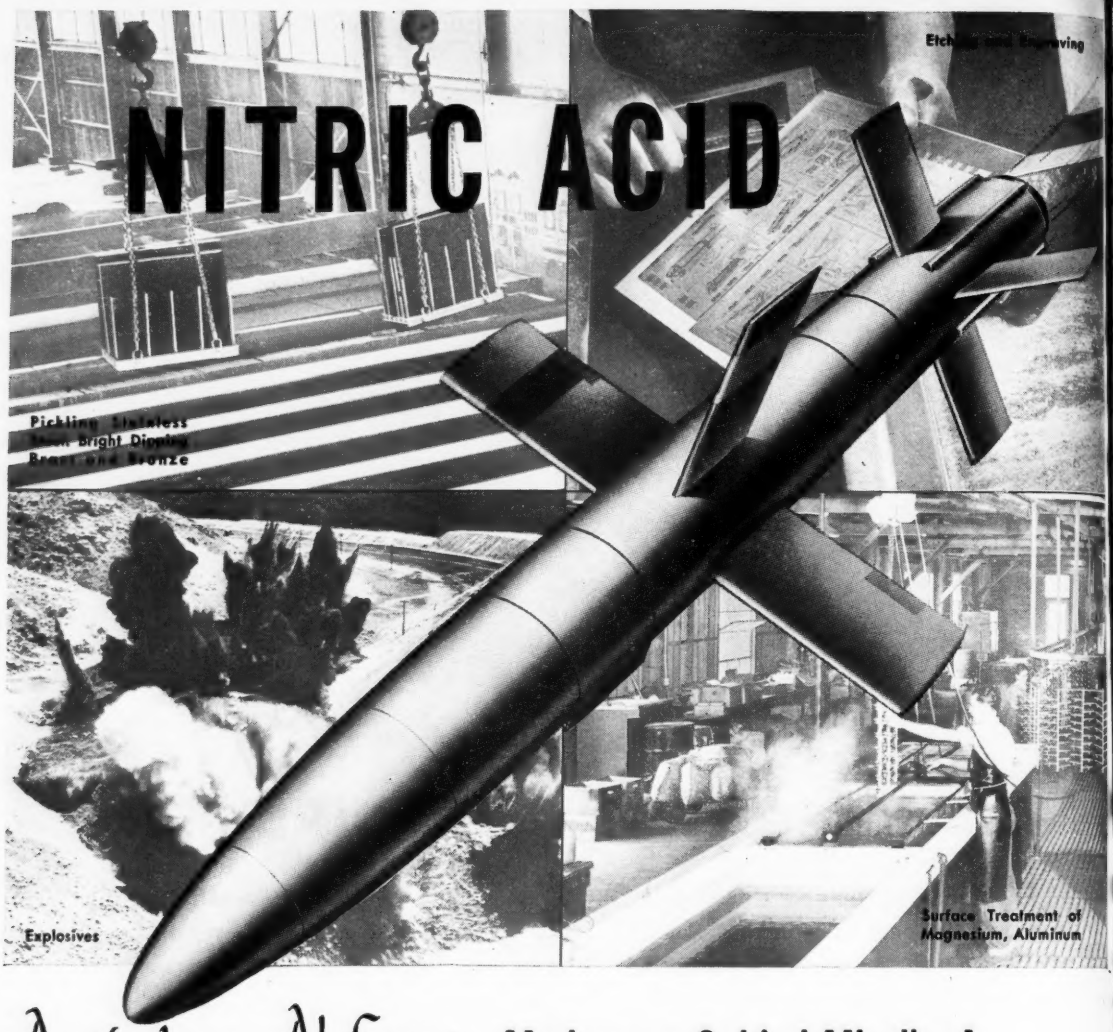
But there is one essential quality required of all brands—regardless of the job. It is *dependable, low cost performance!* CONOMATIC users know well its benefits. But you don't have to be a user to know about this feature, or any other feature, of the CONOMATIC. Just write, wire, or phone for the information. There is no obligation.

Cross drilling without costly spindle stopping is one of many CONOMATIC innovations which make use of the machine's unexcelled accommodation to tools and work. But any such facility that saves secondary handling is valuable only because of the more important "built in" qualities that keep the machine running.



A Comparison of ALL Automatics is in favor of Cone

Conomatic CONE AUTOMATIC MACHINE COMPANY, INC. WINDSOR, VT., U.S.A.



Ancient as Alchemy ... Modern as Guided Missiles!

Known for fourteen centuries—yet required for propelling the most advanced aircraft and guided missiles! That's the story of Nitric Acid, the ageless chemical.

Alone, or as a component of mixed acid, Nitric has long had a host of important industrial uses. In today's broad defense program, its role is more vital than ever.

As a primary producer for over 50 years, General Chemical is known for the uniformity and high quality of its Nitric Acid—in any desired strength and grade—for any need. Thorough knowledge of the product and its properties recently led to General's development of the first Anhydrous Nitric Acid, as well as special fuming forms for urgent military and industrial programs.

For your Nitric needs, consult General Chemical first. Further information on any of the grades and strengths listed here may be obtained from the nearest General Chemical office.

Grades of General Chemical Nitric Acid include:

Standard
36°, 38°, 40° and 42° Baume

Diamond*
36°, 38°, 40° and 42° Baume

Photo Engravers
36°, 38°, 40° and 42° Baume

Nitric Acid 95%
(48.5° Be), Diamond and Standard

Reagent, A.C.S.
Sp. Gr. 1.42

White Fuming
Reagent, A.C.S. and Technical, Sp. Gr. 1.49-1.50

Red Fuming
Reagent, and Technical, Sp. Gr. 1.59-1.60

Anhydrous
Total acidity 99.8% min.

*Highest Commercial Quality

BASIC CHEMICALS
FOR AMERICAN INDUSTRY

GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

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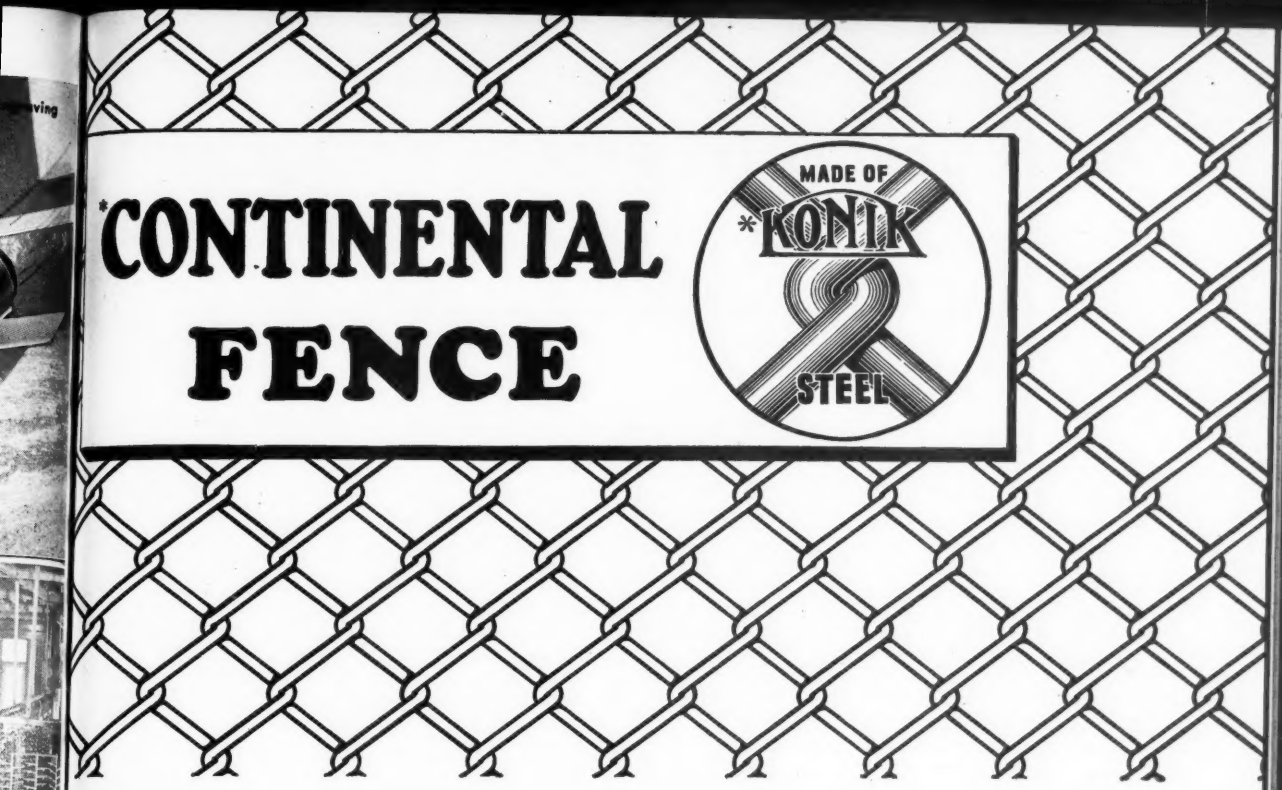


*CONTINENTAL FENCE

MADE OF *KONIK STEEL

KEEP YOUR GUARD UP...

DAY AND NIGHT...FOR YEARS AND YEARS

heck the advantages that pay for fence protection. Count the vings from reduced fire risk—lower insurance rates. Add e gains you make by increasing outdoor storage space. Save y letting fence guard your property. Then add the savings ou get with Continental Chain Link fence. Only Continental nce is made of KONIK steel containing copper, nickel and hromium for lower protection costs per year of fence life. Plan ow to keep a good guard up—and make sure it's Continental ONIK fence—for protection savings . . . for longer fence life.

*Trade Marks Reg. U.S. Pat. Off.

The Only Fence Made of * KONIK STEEL

KONIK contains copper, nickel and chromium for greater strength and longer life. And, the KONIK fabric is galvanized *after weaving* for even greater protection against rust and corrosion. Only Continental Chain Link fence is made of this better KONIK steel.

*Due to present National Defense requirements for nickel and chromium, two critical war materials, Continental Fence at present is available in Copper Steel only.

STEEL MILLS NEED SCRAP BECAUSE YOU NEED STEEL

CONTINENTAL STEEL

CONTINENTAL STEEL CORPORATION

GENERAL OFFICES • KOKOMO, INDIANA

DUCERS OF *Manufacturer's Wire* in many sizes, pes, tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, Lead Coated, and special wire. ALSO, Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

Here's what metal working management will want to know about Microcarb Control

NOTHING else can do what Microcarb does in controlling the carburization of steel parts. Gears, shafts, cams, bearings and all the other items which owe some of their high quality and low cost to the carburizing process can now be made even better—and possibly at even lower cost.

The cause of such improvement is simply that Microcarb measures directly the carburizing "strength" of the furnace gases which supply carbon to the work being processed.

Heretofore many carburizing equipments have measured the amount of carbonaceous material fed into the furnace, but none has **directly** measured the active carbon in the hot furnace gas. For a comparison, think of heating your home by putting fuel in the furnace, without a thermometer to tell the temperature. Keeping your home at the same temperature day in and day out would then be an art rather than a science; some one person's judgment would have to be accepted, but there'd be no check. The comparable condition has heretofore been quite common in carburizing operations, everywhere.

Microcarb ends that uncertainty; it measures and controls carbon directly. Heat-treaters simply set the Microcarb Controller at 90 if they wish to carburize to ninety carbon. "The carbon you set is the carbon you get".

The "reason why" for Microcarb is its carbon detecting element. This invention, called a Carbohm, is an engineering rarity—a truly new device for sensing a change in its surroundings.

Basically, a Carbohm is a wire, made of an alloy which will either absorb carbon from the furnace atmosphere, or lose it to the atmosphere, until it and the atmosphere are in equilibrium, carbon-wise.

With every change in the wire's carbon content, there's a corresponding change in its electrical resistance. The two Microcarb instruments — Controller and Carbon Recorder—translate this resistance directly into terms of percent carbon, control on that basis and record the result.

Only Homocarb carburizing equipment of our new Series H can be used with Microcarb, because the furnace and its temperature control must be designed to meet the needs of atmosphere regulation. Specific features are a soundly designed electric furnace with solid-bottom retort, improved fan housing and work support, and aerodynamically designed discharge jets. Micromax temperature control of the Duration-Adjusting Type is included.

Microcarb is many things to many men, especially in defense work.

To top management, Microcarb means better competitive position (for the individual company) quality-wise and possibly cost-wise. Also, it meets the usual desire for process control which is fully automatic.

To production executives, Microcarb means closer following of production schedules, because carburizing speeds and results are definitely more predictable than ever before.

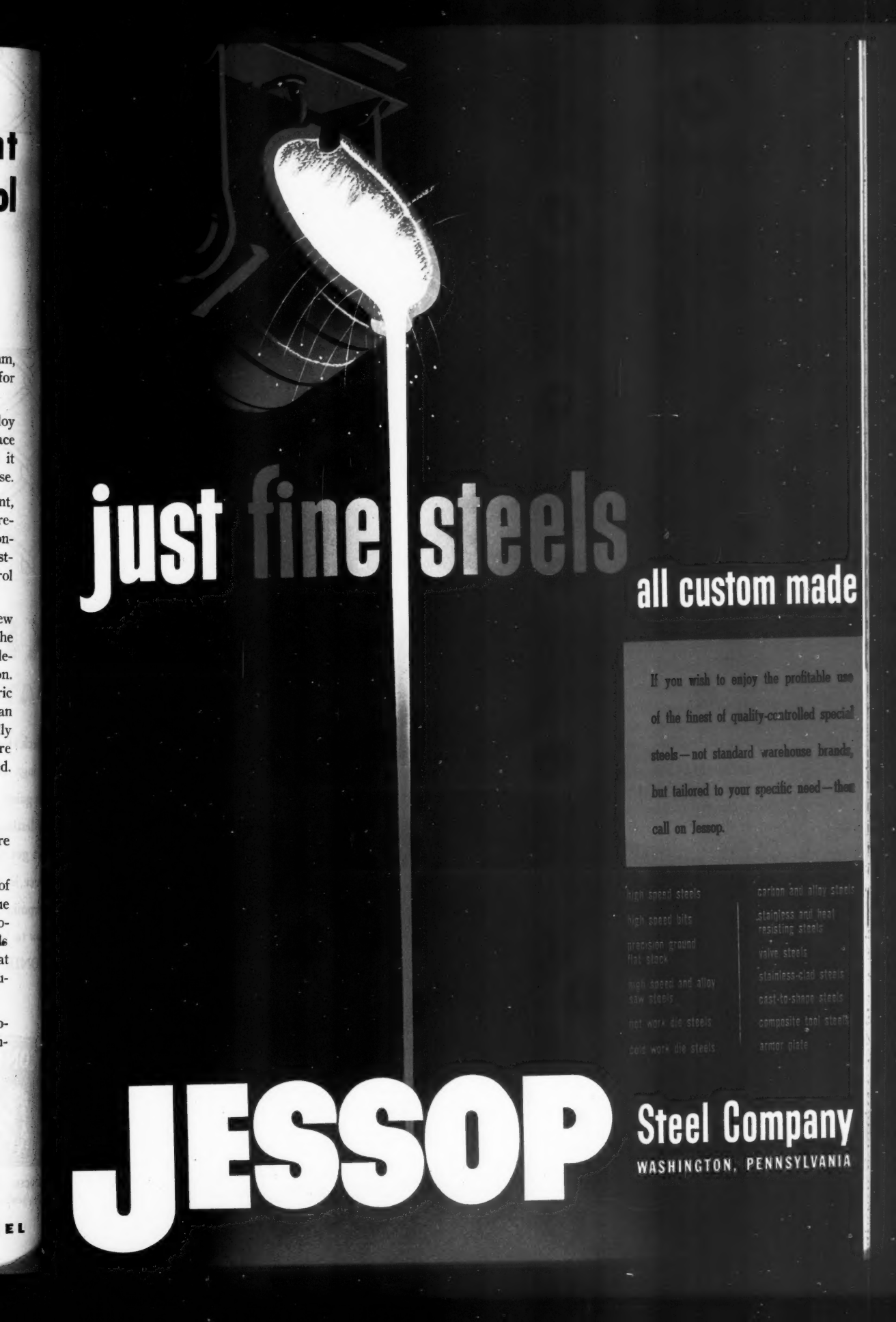
To personnel executives, Microcarb means cleaner, more attractive working conditions. And, if the heat-treat uses incentive pay, Microcarb helps heat-treaters increase their earnings, because it makes it easier for them to apply their skill and therefore increase their productivity.

To metallurgists, Microcarb means some or all of the above advantages, plus a tightening of technique such as every technician likes. "New" or hard-to-handle steels hold fewer puzzles. Standard steels emerge with closer specifications. The heat-treat takes another long step toward becoming a manufacturing laboratory.

Let us send you further facts about this new Microcarb Control. Ask our nearest office, or 4957 Stenton Ave., Phila. 44, Pa.

LEEDS NORTHRUP

Jrl. Ad. TD4-623(4)


just fine steels
all custom made
If you wish to enjoy the profitable use of the finest of quality-controlled special steels—not standard warehouse brands, but tailored to your specific need—then call on Jessop.
high speed steels
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valve steels
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JESSOP
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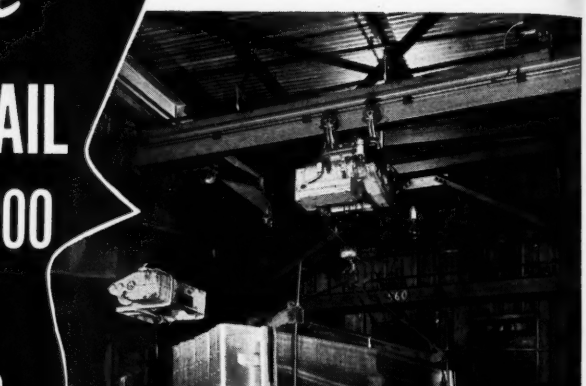
WASHINGTON, PENNSYLVANIA

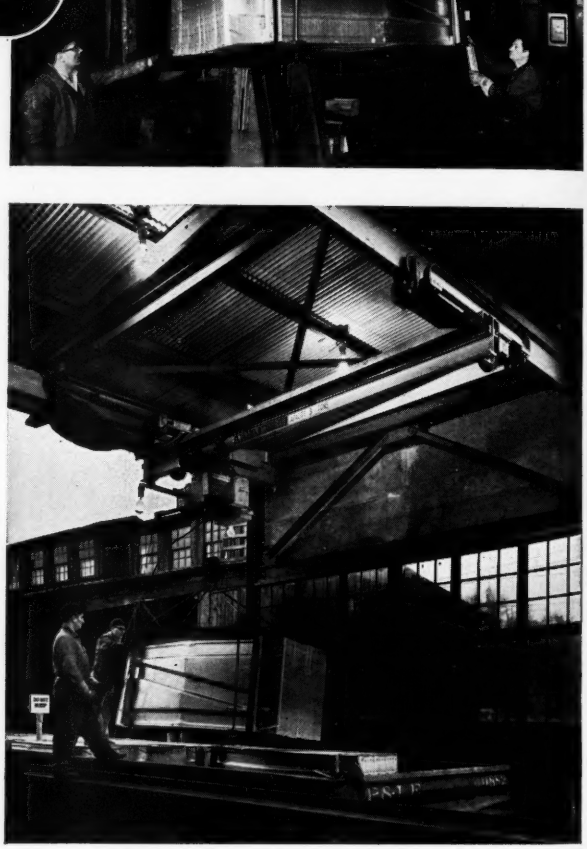
This Simple AMERICAN MONORAIL SYSTEM Saves... $12,800 Annually in HANDLING COSTS



● A saving of 64 man-hours per day (2 shifts) resulted when this unique, simple American MonoRail Overhead Handling System was installed. Thirty-two freight car panels are strapped into one bundle—then by aid of a RailMaster Crane and special carrier on crane bridge, two men are able to transfer bundles from shipping room to dock directly into gondola cars.

This entire MonoRail system cost less than $10,000. The yearly savings run well over this figure, therefore the system pays for itself in less than one year.

We'll be glad to apply this "know-how" to your handling problems—just drop us a note. No obligation, of course.



SEND FOR BULLETIN C-1, a 56-page book showing successful applications of American MonoRail Systems.

THE AMERICAN MONORAIL COMPANY

13102 ATHENS AVENUE CLEVELAND 7, OHIO

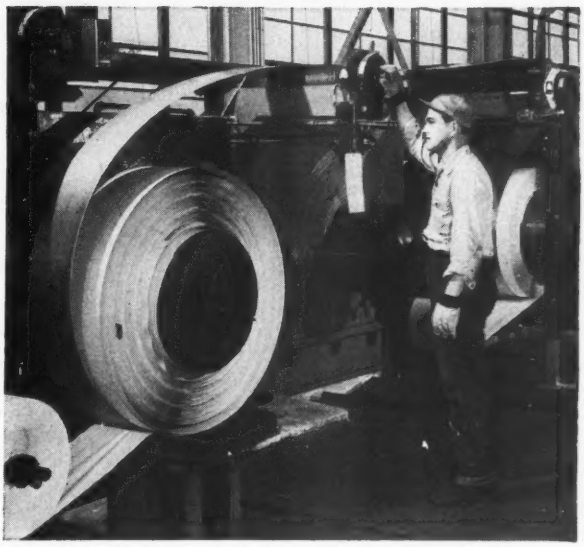
G-E ADJUSTABLE-SPEED DRIVE "SPOOLS" STRIP STEEL FASTER!

"Packaged" Speed Variators boost winder output by eliminating time-consuming tension adjustments

Without the proper drive on the winders, "spooling" chrome strip steel as it comes off an annealing line can be a difficult time-consuming operation. "Spool" build-up will vary with the gage of the steel being processed. This affects tension on the strip as it is being wound, making it necessary to make many time-wasting manual adjustments.

The Wallingford Steel Company overcame these difficulties recently when it installed seven G-E Speed Variators on its annealing line. Today, the winders operate automatically after an initial setting. The speed variators handle all operating speeds from 5 to 80 feet per minute. And because each drive is "packaged", it is simple to operate one, two, three or all of the winders in the line simultaneously.

The speed variator, one of G-E's adjustable-speed family, is helping manufacturers in every field to increase production with improved quality control, saving scarce materials, cutting rejects, and increasing versatility of existing machinery. There's a good chance that one or more of this versatile adjustable-speed drive family can do the same for you. Send the coupon below for complete details. *General Electric Company, Schenectady 5, N. Y.*



Once the operator makes a speed setting, the winder, equipped with a G-E Speed Variator Drive, maintains that speed automatically and holds tension constant during roll build-up.

WHICH DRIVES ARE BEST FOR YOU?

This 26-page manual will help you decide. It shows you how to go about selecting the *right* drive. The handy drive chart included is worth your detailed study. Bulletin GEA-5334. Check here. . . . . ☐

General Electric Company, Section B 646-15
Schenectady 5, N. Y.

Please send me the bulletins checked:
☐ for reference only
☐ for planning an immediate project

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

THE ACA MOTOR—*Speed ranges to 20:1*—An adjustable-speed a-c motor. Speed range 3:1 or 4:1 continuous; for intermittent operation from 6:1 to 20:1. Bulletin GEA-4883. Check here. . . . . ☐

THE SPEED VARIATOR—*Speed ranges to 40:1*—An adjustable-voltage d-c drive that uses a-c power. Speed ranges 8:1 to 40:1 and beyond. Bulletin GEA-5335. Check here. . . . . ☐

THY-MO-TROL*—*Speed ranges to 100:1*—The most accurate, most versatile, and fastest acting of all G-E adjustable-speed drives. Speed ranges of 100:1 or better. Bulletin GEA-5337. Check here. . . . . ☐

ELECTRONIC SPEED VARIATOR—An electronically controlled version of the Speed Variator that offers most of the features of Thy-mo-trol for applications in the 15 to 60-hp range at moderate cost. Bulletin GEA-5336. Check here. . . . . ☐

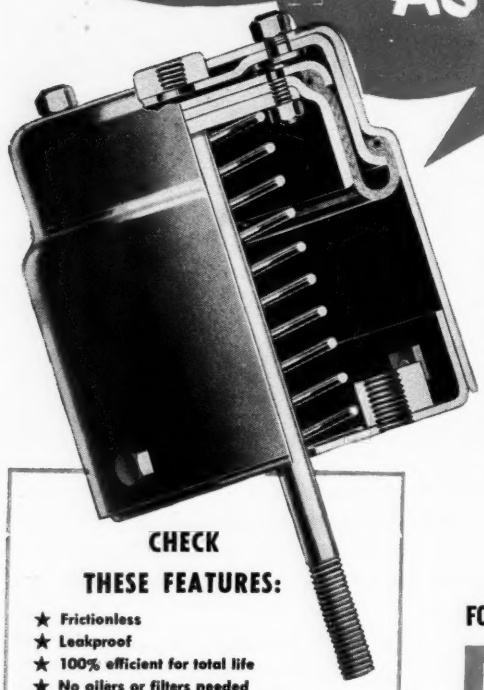
** Thy-mo-trol is the General Electric Company's registered trademark for its electronic motor-control system.*

Headquarters for ELECTRICAL ADJUSTABLE-SPEED DRIVES

GENERAL ELECTRIC

ON OLD OR NEW MACHINE TOOL OPERATIONS—

YOU CAN STEP UP YOUR PRODUCTION AS MUCH AS 30%



....WITH THIS SIMPLE, RUGGED, LOW COST AIR CYLINDER!

The pressure for production is on! Manufacturers everywhere find it increasingly difficult to keep pace with the demands of the day. But there is a way—a brand new way requiring no addition to manpower, no addition to plant facilities. The answer? Remarkable Bendix-Westinghouse Robotair Industrial Controls. With their wide range of applications, Robotair controls offer you amazing improvements in production speed and economy through increased productivity of man and machine at *unbelievably low initial cost.* Robotair units are available as original equipment for machinery manufacturers or for easy installation on shop equipment.

Send today for an informative booklet and find out how you can cut costs, speed production with Robotair! Address Bendix-Westinghouse Automotive Air Brake Co., Dept. G, Elyria, Ohio.

CHECK THESE FEATURES:

- ★ Frictionless
- ★ Leakproof
- ★ 100% efficient for total life
- ★ No oilers or filters needed
- ★ Holding pressures up to 5000 lbs.
- ★ Diaphragm has rolling action and exceptionally long life
- ★ Made from high grade steel stamping—all metal parts cadmium plated
- ★ Chrome Molybdenum Steel Push Rod heat-treated for maximum toughness
- ★ Easily installed

FOR HOLDING, CLAMPING, BENDING, SWEDGING, STAKING, RIVETING

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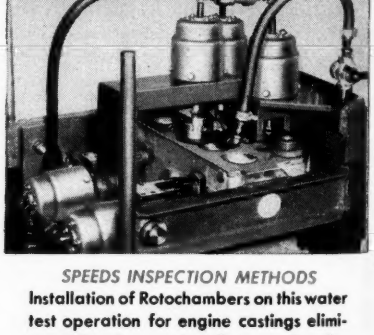
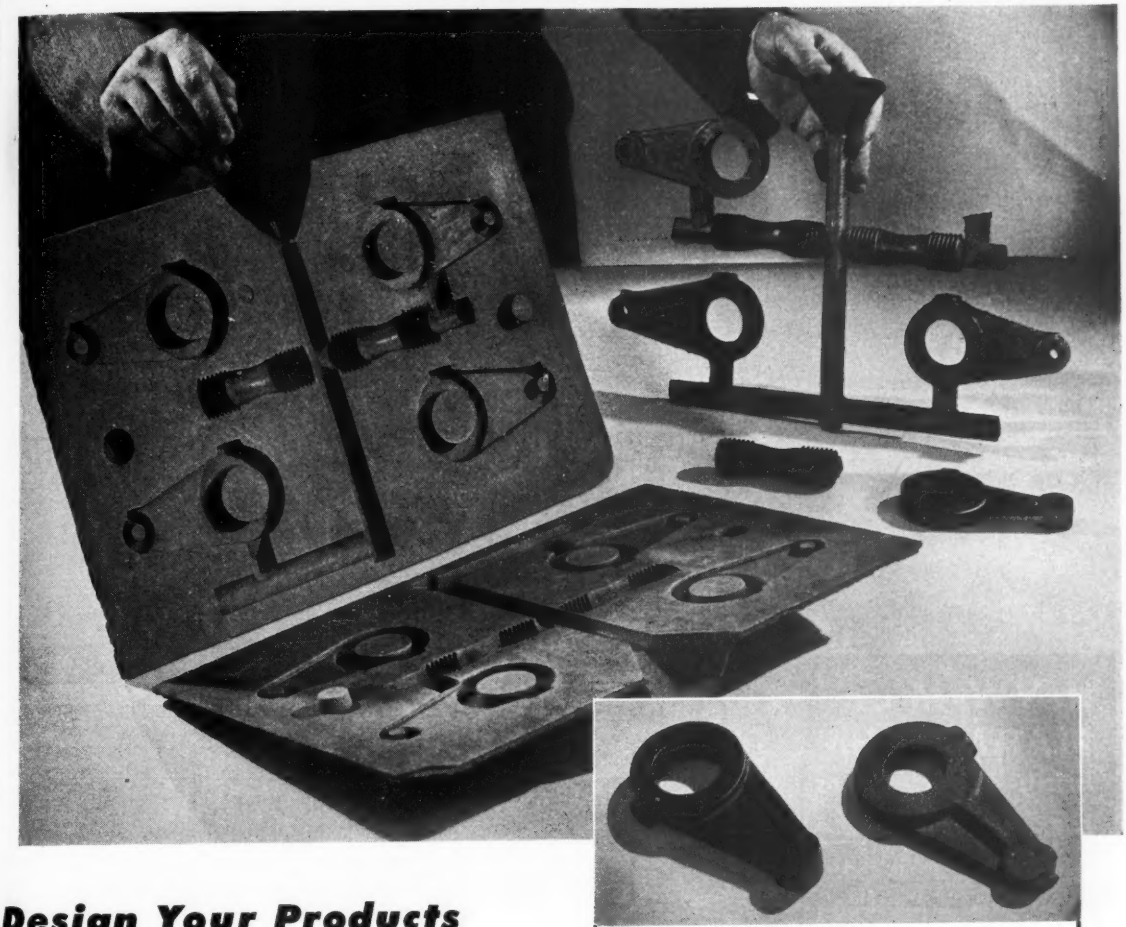
REDUCES OPERATOR FATIGUE
Four Rotochambers installed on the fixture in this spot welding operation replaced cumbersome hand clamps, saving time, greatly reducing operator fatigue.



SPEEDS INSPECTION METHODS
Installation of Rotochambers on this water test operation for engine castings eliminated hand operated fixtures, thereby speeding inspection and cutting costs.

THIS PROCESS LOWERS PRODUCT COSTS



SEVEN MINUTES SAVED

Connecting rod at left was cast by the shell molding process. Note smooth surface, minimum excess metal. Rod at right, cast in conventional sand mold, is rougher; takes 7 minutes longer to finish.

Design Your Products or Parts with the Shell Mold Process in Mind!

The shell molding process produces thin-shell sand molds and cores bonded with BAKELITE Phenolic Resins. It permits casting ferrous or non-ferrous metals to such accurate sizes and shapes that you will find it an economical and practical improvement on your present laborious and costly machining operations.

Here are some of the advantages Builders Iron Foundry of Providence, R. I., gained for one of its customers, by using this process for casting the "Meehanite" metal connecting rods illustrated:

- *Surfaces that are virtually pattern-smooth.*
- *Tolerances of .002 to .003 of an inch per inch.*
- *30 per cent reduction in finishing time as compared with green-sand castings.*
- *All holes cast; boring eliminated.*

Why not investigate this remarkable process? Your foundry should know about it. You will find that designing your products with this process in mind can speed production, lower costs, conserve metal, even eliminate serious production bottlenecks.

For further information, write Dept. CP-49.

BAKELITE
TRADE-MARK
PHENOLIC
BONDING RESINS
TRADE MARK

BAKELITE COMPANY
A Division of
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30 East 42nd Street, New York 17, N. Y.

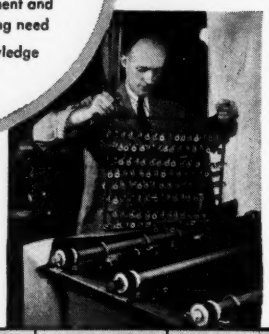
PLATEMANSHIP

H-VW-M's unique combination of:

. . . the most modern and complete laboratory for testing and development

. . . ability to provide complete equipment and materials for every plating and polishing need

. . . the complete background of knowledge and experience in every aspect of plating and polishing.



H-VW-M and PLATEMANSHIP *bring you cleaners for every purpose . . . every need*

METAL TO BE CLEANED	SOIL TO REMOVE	IN SOAK CLEANING	IN ELECTROCLEANING	COMMENTS
IRON & STEEL	LIGHT COATS OF OILS & GREASES	MAT. 2W	MAT. 30W	
IRON & STEEL	LIGHT COATS OF OILS & GREASES		MAT. 2	NON-FOAMING
IRON & STEEL	LIGHT OR HEAVY COATS OF OILS & GREASES	MAT. 30		FOR POWER SPRAY-TYPE WASHING MACHINES
IRON & STEEL	HEAVY COATS OF OILS & GREASES	MAT. 40W	MAT. 45W	
IRON & STEEL	HEAVY COATS OF OILS & GREASES	MAT. 40F		ROSIN SOAP TYPE
IRON & STEEL	HEAVY COATS OF OILS & GREASES		MAT. 40	NON-FOAMING
IRON & STEEL	HEAVY COATS OF OILS & GREASES		MAT. 51W	REVERSE AND DIRECT CURRENT
IRON & STEEL	HEAVY COATS OF OILS & GREASES		MAT. 65-1M	REVERSE CURRENT ONLY
COPPER, BRASS & BRONZE	BUFFING COMPOSITIONS, LIGHT OILS	MAT. 2W	MAT. 30W	
COPPER, BRASS & BRONZE	BUFFING COMPOSITIONS, LIGHT OILS		MAT. 20W	NON-TARNISHING
DIE CASTINGS ZINC BASE	BUFFING COMPOSITIONS, LIGHT OILS	MAT. 20W	MAT. 30W	REVERSE CURRENT CLEANING
LEAD BASE CASTINGS	BUFFING COMPOSITIONS, LIGHT OILS	MAT. SOLVENT #1		
ALUMINUM ALLOYS	BUFFING COMPOSITIONS, LIGHT OILS	MAT. 20W	MAT. 20W	SHORT DIRECT CURRENT CLEANING, NON-ETCHING
ALUMINUM ALLOYS	BUFFING COMPOSITIONS, LIGHT OILS	MAT. 25		ETCHING
MAGNESIUM BASE CASTINGS	BUFFING COMPOSITIONS, LIGHT OILS	MAT. 50W	MAT. 50W	
GENERAL PURPOSE STEEL, BRASS, DIE CASTINGS	RUN OF THE SHOP	MAT. 30W	MAT. 30W	DO NOT USE ON ALUMINUM

The cleaners listed and briefly described above are the H-VW-M Cleaners most generally used by the industry. They are, however, only a part of H-VW-M's service in supplying the plating and polishing industry with essential cleaner requirements. The complete facilities of H-VW-M's modern laboratory are always available for the formulation of cleaners to meet specialized, individual needs.

It is this combination of the ability to fill promptly all ordinary needs, and to develop special products for extraordinary requirements, that makes up *Platemanship*. The metal finishing industry has learned from experience that H-VW-M can always meet and even anticipate requirements in every phase of pickling, polishing, buffing, cleaning, anodizing, and plating.

Bulletin C-106 gives details on the standard line of H-VW-M Cleaners.

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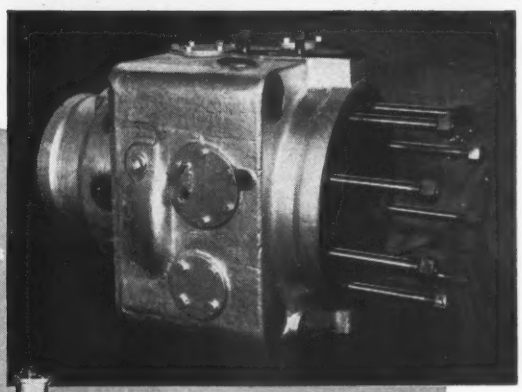
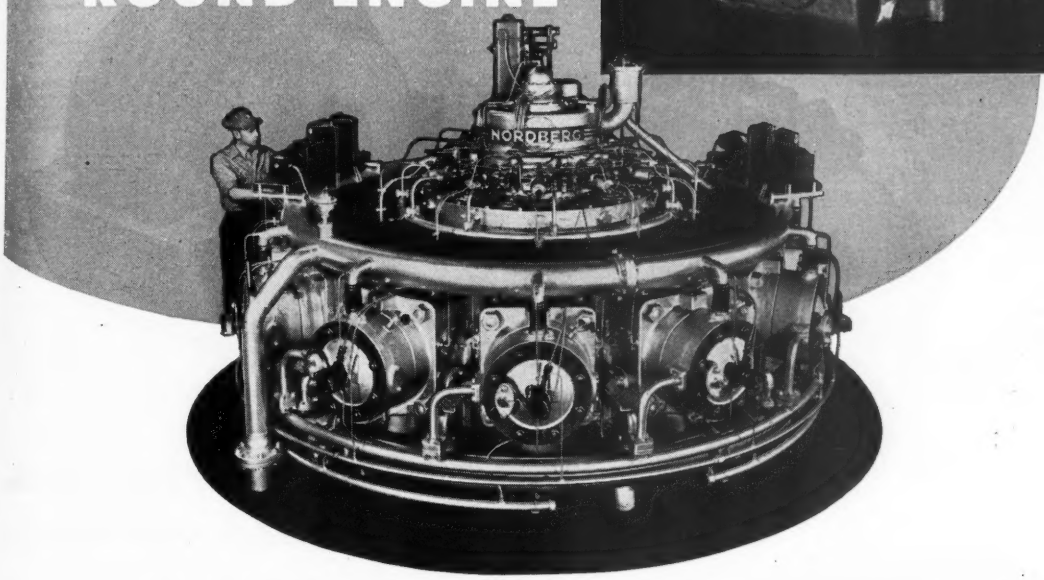
Square Cylinder FOR A ROUND ENGINE





another "difficult" casting made easier with CHATEAUGAY PIG IRON

● It's one of eleven cylinders on the 1650-HP Nordberg Radial Diesel shown above. And because it's a one-piece casting, complete with built-in water jacket, adjoining light and heavy sections are encountered. Thanks to CHATEAUGAY Pig Iron, however, there are no problems of partially-filled molds or uneven cooling.

CHATEAUGAY—Republic's *exclusive* premium pig that outperforms all other irons—imparts exceptional fluidity to any mix in which it is used. It fills every section of the mold . . . cools uniformly . . . provides a uniform grain structure that machines readily and economically.

A Republic Pig Iron Metallurgist will be glad to give you the complete story about low phosphorus, copper-free CHATEAUGAY Pig Iron . . . show you how and where it should be used for most effective, profitable results. Write today to:

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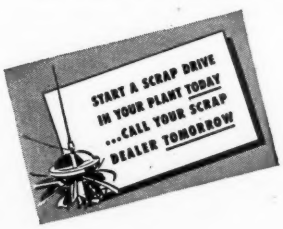

Republic PIG IRON

"CHATEAUGAY"	"REPUBLIC"	"PIONEER"
Low-Phosphorus, Copper-Free	(Northern) Foundry, Basic and Malleable	(Southern) Foundry and Basic

REPUBLIC STEEL

Wherever You are...

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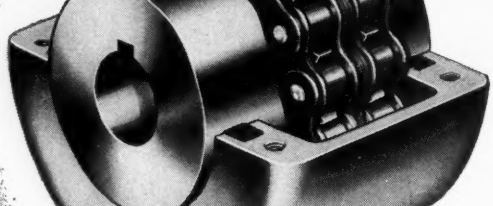

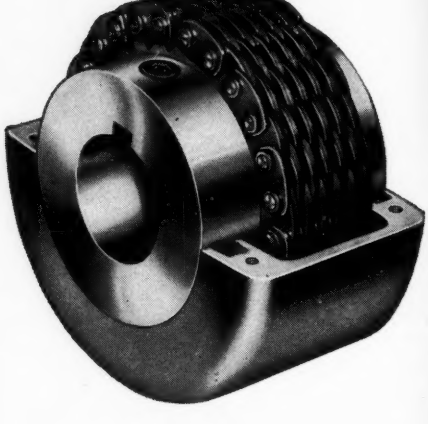

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. . . for replacement or for a familiar application. Just phone or write to your nearest Union Chain Stock Carrying Distributor listed on the facing page, and he will make it his business to see that you get the earliest possible delivery.

. . . or suppose you need engineering advice on the proper use of flexible couplings for the joining of two shafts of the same or different diameters in such a way as to allow lateral movement of either shaft and compensate for a slight misalignment of the shafts. Then you should get in touch with the nearest Union Chain district representative as listed on the facing page.

You will receive competent, experienced counsel, since Union Chain manufactures all types of steel drive chains and is thoroughly accustomed to solving power transmission problems for its customers. We will welcome your inquiry.

UNION ROLLER CHAIN

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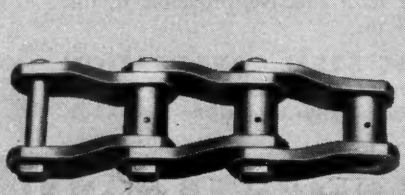

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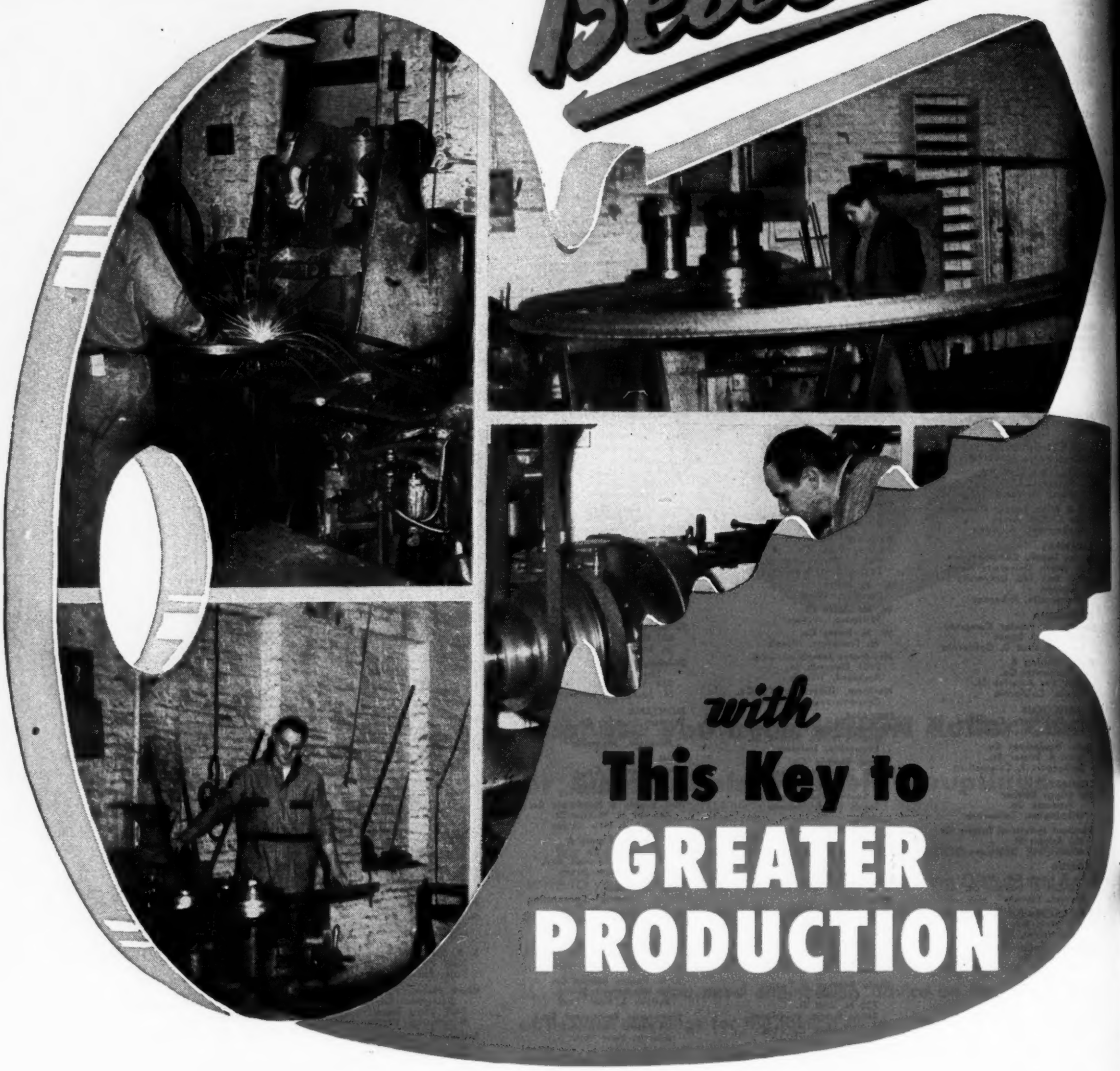

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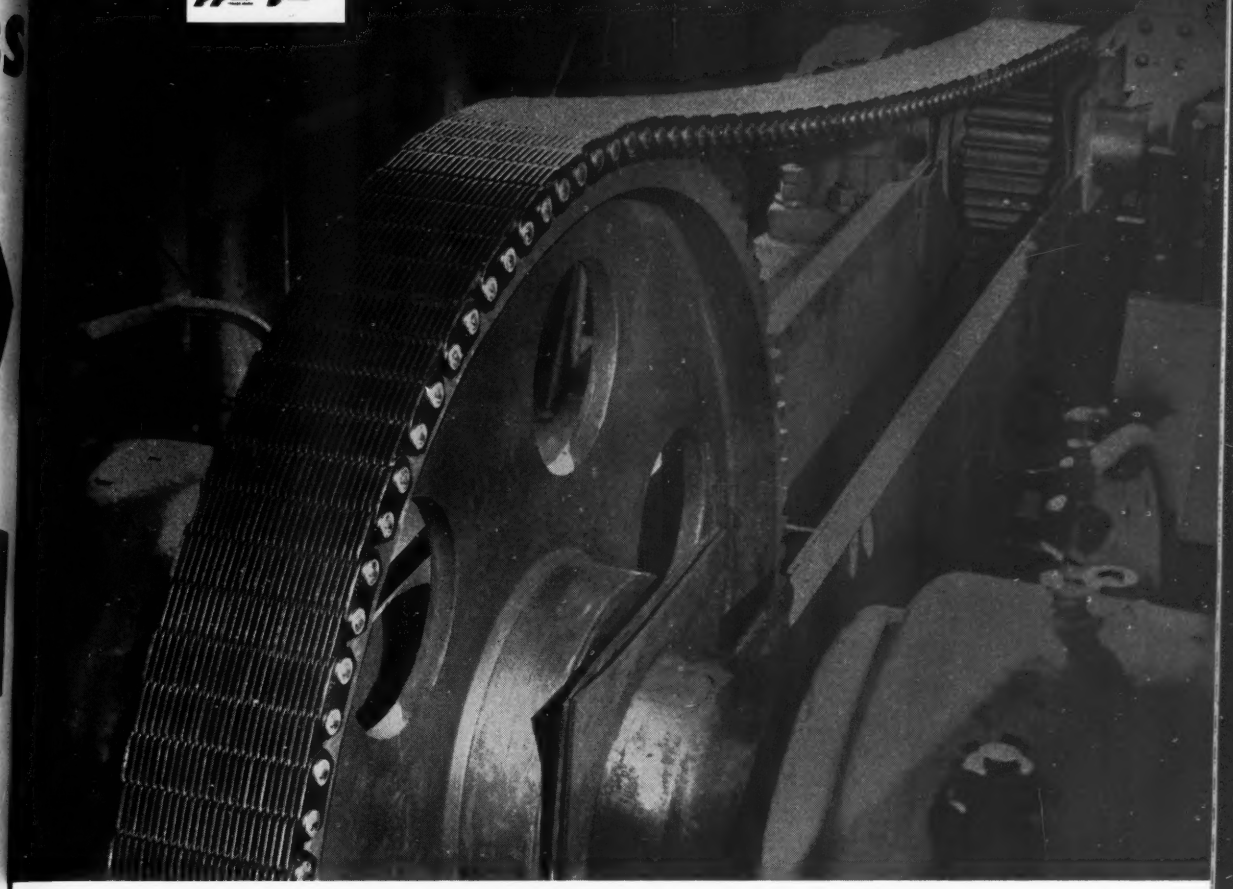
Morse HY-VO Drive for a new age in power transmission



Morse Hy-Vo does 50% more work with 50% less chain

A *200-kilowatt* generator on the Standard Dredging Company dredge boat "Diesel" requires a 12"-wide silent chain drive.

When an additional generator was needed, the boat owners turned to Morse Hy-Vo (above). Result? The new *300-kilowatt* generator is driven by a 6"-wide Hy-Vo Drive. That's 50% more work with 50% less chain—and another application that Hy-Vo takes right in stride.

The Morse Hy-Vo Drive gives up to one-third longer service life, cuts operating costs per hour up to 50%. Morse Hy-Vo transmits more horsepower at greater speed (up to 5000 HP at 1200 RPM) and lower cost than any other standard drive.

New age in power transmission

Hy-Vo permits the transmission of vastly increased horsepower from smaller, less expensive, high-speed engines and motors—without costly accessories. Hy-Vo is the latest addition to a complete line of products that has made the name Morse a byword for the best in power transmission equipment and engineering.

Write today for Hy-Vo Catalog C 72-51 —or for information on Morse Silent Chain or Roller Chain Drives, Morse Flexible Couplings, Morse Drive Shafts, or Morse Clutches. (Hy-Vo orders must carry priority rating at present time.)

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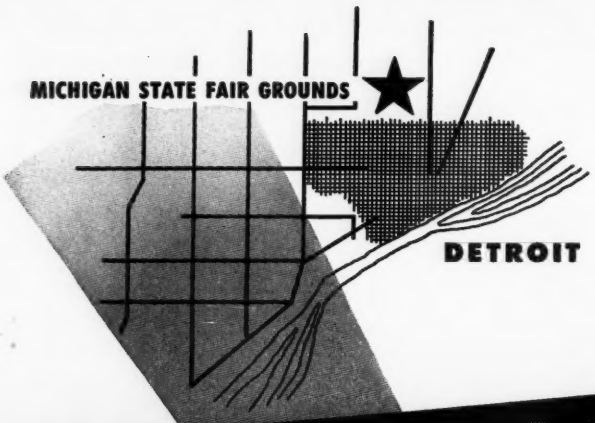

Metal Yardstick— 3 MILESTONES LONG...

Milestones of metal progress . . . of metal research . . . of world-wide metal conservation and utilization . . . these are the brilliant features of the National Metal Exposition of '51 . . . features that will lend a strong lure to the nation's newest and finest achievements in the metal industry. Ask yourself where else on earth you could find concentrated in one place the best brains and the best products of a free world's finest and most basic industry. Be there!

Detroit, Mich.— Oct. 15-19

NATIONAL METAL EXPOSITION

NATIONAL METAL CONGRESS

WORLD METALLURGICAL CONGRESS

Why the sea is salty

IN Norse mythology, a poor man got a magic mill from the elves. With it he could grind whatever he wanted--food, clothing, furniture, and best of all, gold. Of course, the poor peasant's lot changed from poverty to riches.

An envious brother borrowed the mill. He commanded it to "grind herrings and broth and grind them good and fast." But having taken the mill in such haste, he didn't know the magic words to shut it off. He was almost drowned in broth when the brother came to the rescue.

Finally, the magic mill was stolen by a salt dealer, who put it on his ship. Safely at sea, the skipper demanded, "Grind salt and grind it good and fast." Alas, he hadn't learned the control words either. The mill ground salt endlessly, filling all his kegs and his hold, covering the decks and at last sinking the ship. There at the bottom of the sea, so people say, the magic mill still grinds--and that's why the sea is salty.

From time immemorial, men have dreamed about magic mills and schemes to bring abundance and riches. Here in America, today, there are plans that are flooding us with superabundance of certain commodities. But what about the magic words to shut off the mill?

Isn't it time we see the truth in this ancient Norse myth, that "too much" is just as foolish as "too little?" We may well remember this first law of economics: In a *free* market, supply can adjust itself to demand--whether it be potatoes or steel--without sinking the ship. Here is a must job for all thinking Americans.

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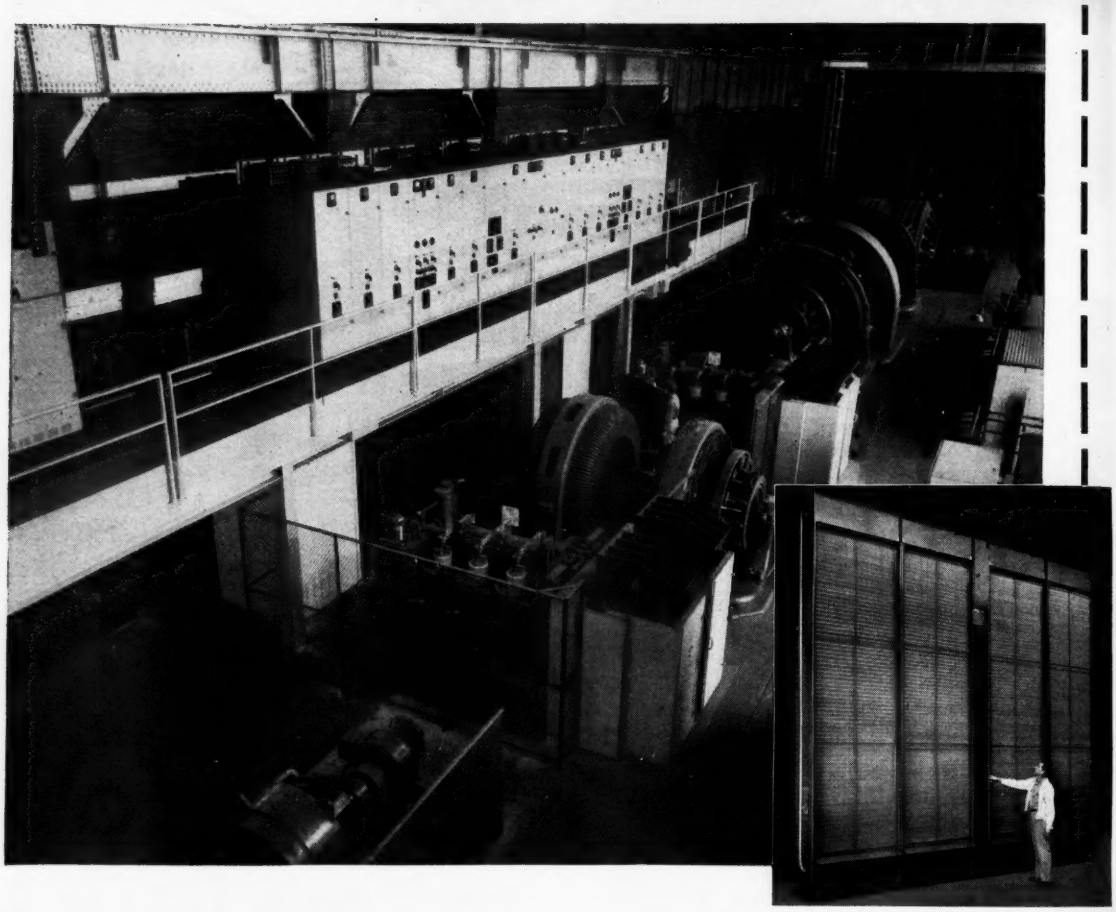

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dust can't damage these motors!

AAF Multi-Duty Filters Supply Clean Air for Blooming Mill Motor Room

This blooming mill motor room in a large steel plant has clean air protection supplied by AAF's Multi-Duty filters. Clean air is important to mill motor efficiency . . . and to save motor wear. These self-cleaning filters insure long motor life, maximum efficiency . . . reduce both shutdowns and maintenance on motors . . . for a small percent of motor cost.

The Multi-Duty is an ideal filter for this type of application where constant clean air volume is required. It is fully automatic and self-cleaning . . . assuring maximum operating efficiency at all times without dependance upon the human element. The exclusive principle of overlapping panel construction in the Multi-Duty was introduced by AAF in 1927. It is still the most practical method of combining the function of self-cleaning with the operating cycle. Although there have been many improvements in the design of individual panels and in construction, this basic principle has never been surpassed.

For a sound investment in motor protection write today for Multi-Duty Engineering Bulletin No. 241B.

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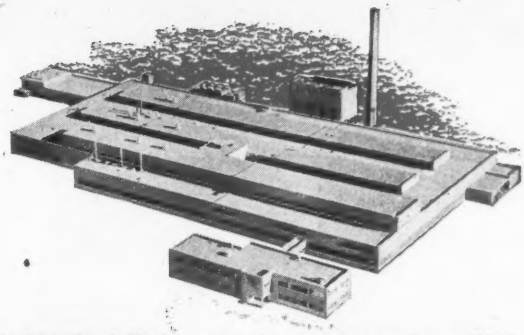

N-B-M Meadville . . . where the welcome mat is out. We're proud of this plant—its equipment and the skilled people who work in it. Proud enough, in fact, to offer a standing invitation to Blast Furnace Superintendents or other steel mill officials to visit us. When can *you* make an inspection trip?

These Bosh Plates take it standing up

Here's where you'll find *vertical* molding of copper castings . . . resulting in cleaner metal throughout.

Another reason why N-B-M Meadville is a name to remember when you specify copper castings. During 75 years of foundry experience, you learn many answers to better methods of production . . . methods that *improve casting quality and soundness.*

At N-B-M Meadville, one of these quality-improving production methods is *vertical molding*—eliminating chaplets. We've found—both by test and on-the-job experience—that vertical molding means uniformly higher quality. Any N-B-M Representative will welcome the chance to describe this unique method to you.

From the molding floor to the shipping room, N-B-M Meadville accomplishes what should be, and is, the main objective of this modern, well-manned plant . . . ***what you specify . . . we ship.***

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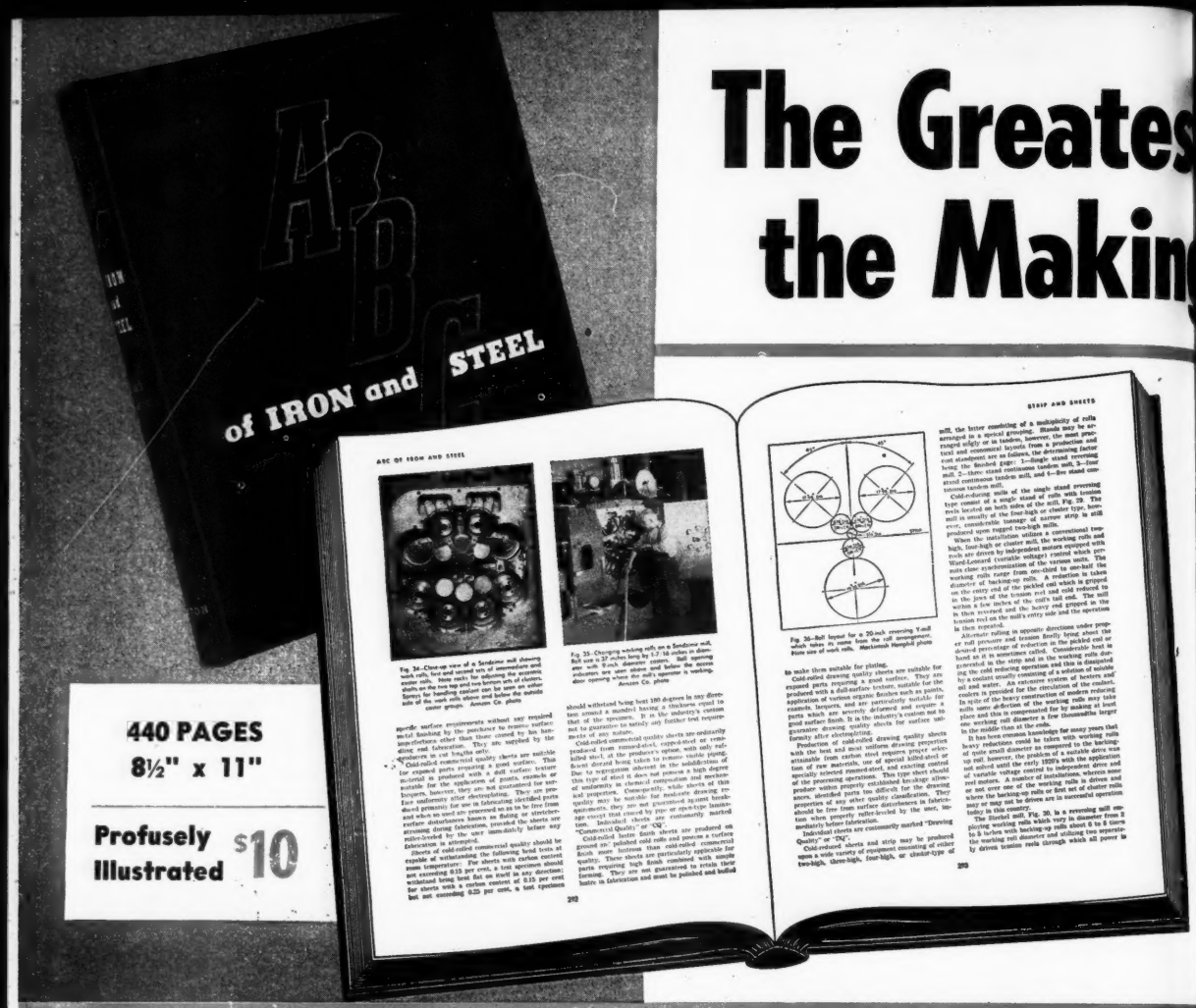

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TEXACO

TEXACO CUTTING, GRINDING AND SOLUBLE OILS FOR FASTER MACHINING

The Metalworking Outlook

September 10, 1951

Warehouses Pinched

If you're a small buyer of steel, brace yourself. Under the closed-end Controlled Materials Plan, 23 per cent less steel will be supplied to warehouses in the fourth quarter than the average of their receipts during the first two quarters of the year, predicts American Steel Warehouse Association. That will come about because in the first half of this year distributors have been getting their allocated tonnage—at least 85 per cent of shipments made to them during the first nine months of 1950—plus some "free" steel. The free metal will be gone after Oct. 1. An NPA order giving more steel to warehouses is in the works, but it won't become effective until the first quarter, at least.

Nickel: More Coming

Prospects for nickel are a shade brighter. International Nickel Co. of Canada Ltd., the world's largest producer, will have boosted its capacity 5 per cent in 1951. Falconbridge Nickel Mines Ltd., the other principal Canadian producer, also has increased capacity. A third and new Canadian nickel producer will be operating within the next two or three years, and there will be sizeable production again from Cuba soon. Nickel today is one of the metals in tightest supply and is classed in Group I of NPA's list of metals' availability. Others in that group which lists metals in shortest supply include copper, aluminum, lead, tin, zinc, tungsten, cobalt, molybdenum and columbium.

Double the Price

Europeans are offering to sell aluminum pig in the U.S. at 39 cents a pound, compared with the controlled domestic price of 18 cents. The going foreign aluminum prices are averaging about 35 cents a pound. The situation makes it tough for any new domestic producers to get started. That's why Harvey Machine Co., which hopes to get into production in Montana, may have trouble. It can get a $46 million DPA loan only if it puts up a $1 million bond and raises another $8 million.

Boon to Small Business

The Navy buying program is proving a boon to small business. That service is in charge of all Armed Forces hand tool procurement and in fiscal 1951 bought $45 million worth, 64 per cent of which went to small business. A good Navy subcontracting possibility is in shipbuilding. Four new vessels will be built and 98 converted in naval shipyards.

The Navy Can Help

Need machine tool, forging or foundry work to complete a defense contract on time? The Navy has some such facilities with open capa-

Production-Engineering News—p. 89 *The Market Outlook—p. 155*

city for use by distressed armament contractors. If you're interested, inform the contracting officer of the Armed Service that originally issued your contract. The Navy facilities are available for Navy, Army or Air Force jobs.

Renegotiation: Action Coming

Watch for more directives on defense contract renegotiation. There's been a long delay in implementing the Renegotiation Act of 1951 passed last March, but four members of the Renegotiation Board required under the new law have at last been appointed. They are John T. Koehler, assistant secretary of the Navy; Frank L. Roberts, chairman of the Military Renegotiation Policy & Review Board set up under the old law; Lawrence E. Hartwig, chairman of the Contract Appeal Board of GSA; and John H. Joss, attorney for GSA.

Double Penalties

Move carefully in making salary changes in your organization. You'll be subject to double indemnities if you step out of line. The Wage Stabilization Board can penalize you once; the Revenue Department can penalize you the second time, points out Harry H. Rose, a Cleveland CPA and attorney. In salary changes made after Jan. 25, 1951, the Revenue Department must disallow the total amount of over-ceiling salaries paid, not merely the portion that's illegal.

The Farmers Are a Factor

Farmers remain a potentially tremendous market for metalworking equipment. Watch your step in criticizing the farm parity system or any other schemes to increase the farmers' incomes. In a preliminary survey of 203,000 farms in Iowa by the Census Bureau, only 117,000 had water pumps, 51,000 water heaters, 30,000 home freezers, 42,000 milking machines, 59,000 trucks, 13,000 pick-up hay balers.

Straws in the Wind

A new military specification has been set up for hot lacquer as a one-coat finish for shells, bombs, grenades and other ammunition components . . . W. B. Quail, Armco Steel Corp., will succeed Richard F. Sentner, U.S. Steel Co., as director of the NPA Iron & Steel Division. . . . Consolidated Vultee Corp. has won an Air Force contract to develop an atomic-powered aircraft.

Here and There in Industry

Some 55,000 tons of primary copper have been lost from strikes since July 1, a deficit that may mean more troubles for CMP (p. 61) . . . Fourth quarter consumer durable allotments under CMP may have to be changed because of the copper situation (p. 61) . . . Structural steel shortages will delay defense expansions (p. 62) . . . The load is heavy on wire rope makers (p. 63) . . . Man the pumps: that's the cry of pump and compressor manufacturers who need more manpower (p. 64) . . . Electroplaters face a shortage of both materials and new business (p. 65) . . . Welding rod production, a good indicator of the defense output rate, promises to be 50 per cent higher in 1951 than 1950 (p. 72).

Here they are-

the safer coarse tooth saws all America is talking about!

SAFETY FROM KICK-BACKS
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REQUIRE LESS POWER
FEWER TEETH TO SHARPEN
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ATKINS first brought out the safer, free-cutting, coarse-tooth saw *in 1931.* Today ATKINS manufactures this increasingly-popular saw in two types—*DurAtip* (Carbide Tipped) and *Solid Tooth!*... Sold exclusively through Industrial Distributors, these *"Silver Steel"* saws are safer from kick-backs, take less power to operate, are particularly efficient for ripping purposes!... If YOU can use safe coarse-tooth saws to advantage, *it will pay you to get the brand which has been tried and proved for the past twenty years—ATKINS!*

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Keep this in mind about Armco ZINCGRIP Steel:

Its *special* hot-dip zinc coating works more like rubber than metal. It flows and s-t-r-e-t-c-h-e-s in brakes and dies. It takes as severe a draw as the base metal without flaking or peeling.

Compare this with conventional galvanized sheets. When these sheets are drawn or formed severely the coating invariably flakes or peels. This exposes the base metal to early rusting and failure.

Armco ZINCGRIP has another important advantage. Actual field tests show that its special zinc coating gives longer protection against rusting in atmospheric service than equal-weight coatings on regular galvanized sheets.

Even if you can't include this Armco Special-Purpose Steel in your present plans, it will pay you to have complete technical and merchandising information for the day when it is more plentiful.

More Scrap Means More Steel!

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Congress Muddles Along

Throughout 14 days in June, 1951, the Senate Committee on Expenditures in the Executive Departments conducted hearings on ways and means of improving the organization and operation of Congress. Scores of congressmen, senators, government officials and private citizens spoke freely and earnestly on numerous handicaps which prevent members of Congress from performing their duties efficiently. Conduct of the hearings chairmanned by John L. McClellan of Arkansas was exceptionally competent.

In reading the transcript of these hearings the ordinary taxpayer will be impressed with the frank admission by most of those who testified that Congress is hamstrung by archaic rules and procedures. For instance, Sen. Hubert H. Humphrey (Minnesota) said "There is just no way that we can plan anything. The only business in the United States that does not make any plan at all concerning the proper use of its time is Congress."

Robert Heller, Robert Heller & Associates, testified: "As Congress operates today, it has no center of responsibility. There are no clear lines of authority and accountability. In short, Congress does not have a formal definite operating organization. It lacks management."

Sen. Henry C. Dworshak (Idaho) asked Mr. Heller: "Do you realize to what extent members of Congress are required to entertain constituents who visit the national capitol?" and "Do you realize the difficulty of a congressman or senator delegating that duty to some assistant?" Mr. Heller said he understands—"they are difficult."

Throughout the testimony are dozens of similar references to time-consuming activities. For instance, the House spends the equivalent of a month each session answering roll calls. Much of this time could be saved by installing an electric roll-call system, as 26 state legislatures have done. It was pointed out that it took the Senate two weeks and 500 pages of "The Congressional Record" to repeal the tax on oleomargarine.

Fortunately some members of Congress seem to be awake to the urgent need for modernizing congressional regulations and procedures. A few bills have been introduced to remedy certain glaring faults. But this is not enough. The public should show more interest in these important reforms.

T. L. Shaner

EDITOR-IN-CHIEF

WHAT GOES ON HERE? Through no fault of ours, two items in this issue from independent sources virtually swear at each other. In the news section is a report on the success of the "productivity team" idea inaugurated by Economic Co-operation Administration in March, 1949. In the 29 months since that date 4900 Europeans have visited American

plants on 625 projects. Between now and next June 30, about 500 more visitors are due to study our methods. Apparently the visitations are beneficial. ECA cites cases in England, France, Belgium and Holland where production has increased up to 50 per cent due to the application of ideas originating from these visitations.

The other item pertains to European-built lathes, shapers and milling machines offered for sale in the United States. Prices are 20 per cent lower than those for equivalent American machines, immediate delivery is promised from New York stocks, no priority is required and—the European companies offering these machines were assisted by ECA funds. What goes on here? —pp. 63, 71, 89

* * *

MOSSBACK INHIBITIONS: A sales engineer temporarily serving in a defense agency in Washington says: "I have learned why government does business the way it does. I used to think the government was manned by men who did not understand business. Since working with these men I have found them to be just about the types you find in private industry. . . . But they have to work in accordance with specific laws, executive orders and regulations that rob them of the flexibility of the man in industry who, to meet a special situation, merely has to get a decision from his boss."

Unconsciously, the sales engineer spots a dreadful curse of Washington. What he terms "specific laws, executive orders and regulations" are out-moded pre-Civil War procedures. Washington pursues horse and buggy routine in a jet-propulsion age. —p. 68

* * *

GUNS AND BUTTER TOO: According to "Ward's Automotive Reports," early this week the four-millionth automobile built in 1951 will roll off one of motordom's assembly lines. From present indications it looks as if output in the third quarter will hit about 1,161,000 cars. If allocations for the fourth quarter had not been changed, automobile production this year probably would have been higher than in any other year in the industry's history, except for record-breaking 1950.

Even with the additional restrictions on the use of steel, copper and aluminum announced by NPA to go into effect Oct. 1, automobile output in 1951 will rank with that of the industry's best years. In fact, we have been building up a capacity for balanced industrial production so tremendous that few of us realize its potential. In many respects, we have taken on the defense burden while making only moderate concessions to "business as usual." —p. 79

* * *

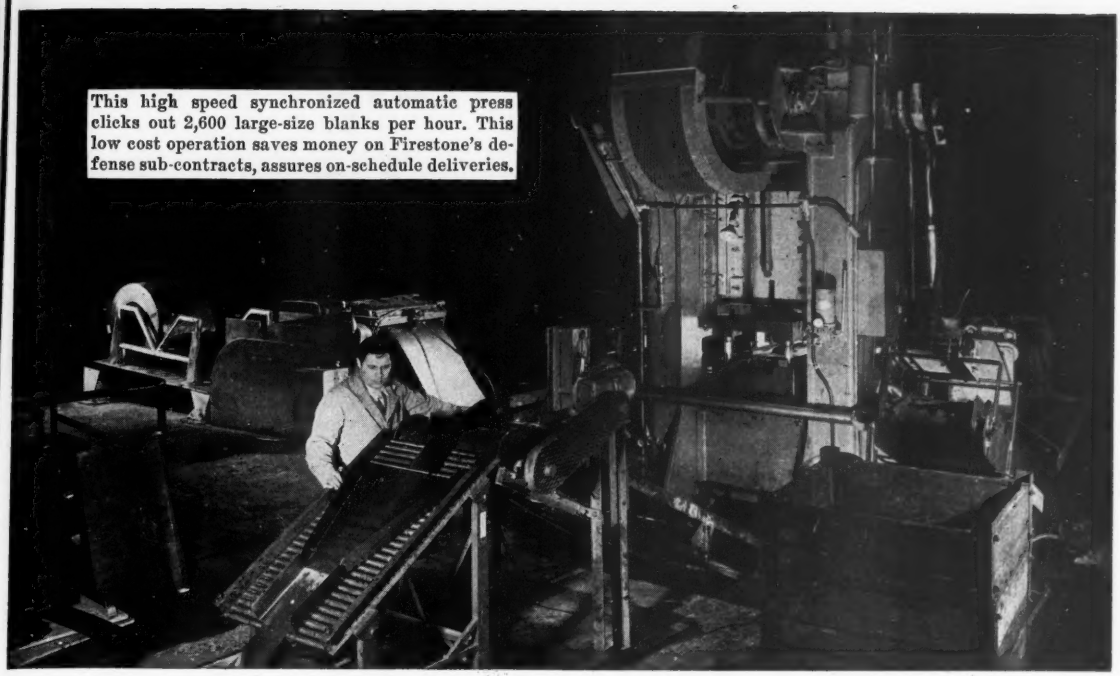
ELECTRODE YARDSTICK: Slightly more than a score of companies comprising the welding rod industry expect to ship over 600 million pounds of their important product in 1951. This is 50 per cent over last year's output but far short of peak annual production of a billion pounds in the hectic war year of 1943.

Welding rod manufacturers are toying with fascinating yardsticks which measure their market in terms of steel output. One is number of pounds of electrode per ton of steel ingot output. Since 1936 this ratio has varied between a low of 2 and a high of 12.2 pounds. Today the figure is 7 pounds. Perhaps a more realistic formula is pounds of electrode per ton of plates, shapes and sheets rolled annually. On this score, the ratio since 1936 has fluctuated between 8 and 47 pounds. In 1950, some 16 pounds of electrodes were used for every ton of plates, shapes and sheets rolled. —p. 72

* * *

SIX SCORE AND FIVE: Throughout the entire metalworking industry there are only a few score companies which can boast of continuous operations for more than a century. In the machine tool industry, three firms have celebrated centennials. These records emphasize the special significance of the open house being held this week by Heald Machine Co. in Worcester, Mass., to commemorate the 125th anniversary of its founding.

Stephen Heald started a modest woodworking shop in Barre, Mass., in 1826. In due course a blacksmith shop and gray iron foundry were added and the company shifted from woodworking to metalworking machines. In 1903 operations were transferred to Worcester, Mass. Today Heald occupies 350,000 square feet of floor space and employs 1500 persons. Four generations of Heald have conducted the business successfully without a break. This is an unusual record. Congratulations for a unique achievement! —p. 100



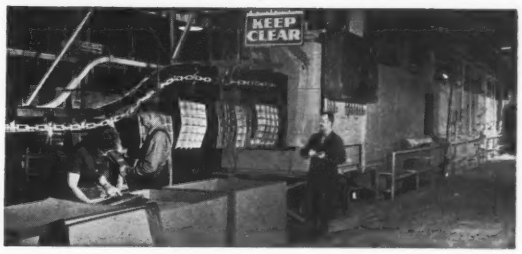
This high speed synchronized automatic press clicks out 2,600 large-size blanks per hour. This low cost operation saves money on Firestone's defense sub-contracts, assures on-schedule deliveries.

NEW AUTOMATIC EQUIPMENT SPEEDS DEFENSE SUB-CONTRACTS AT Firestone

Fast, latest-type automatic presses and new processing, finishing and assembly lines are sound practical reasons why you can count on Firestone for *on-schedule* delivery of your defense sub-contracts. Firestone's modernized metal fabricating plants are geared for fast, low cost production of those heavy large-size stampings and assemblies now so badly needed for aircraft and ordnance equipment and accessories. If your problem is large-size stampings in a hurry, wire or phone Stampings Division, Firestone Steel Products Company, Akron 1, Ohio.

FIRESTONE STEEL PRODUCTS CO.

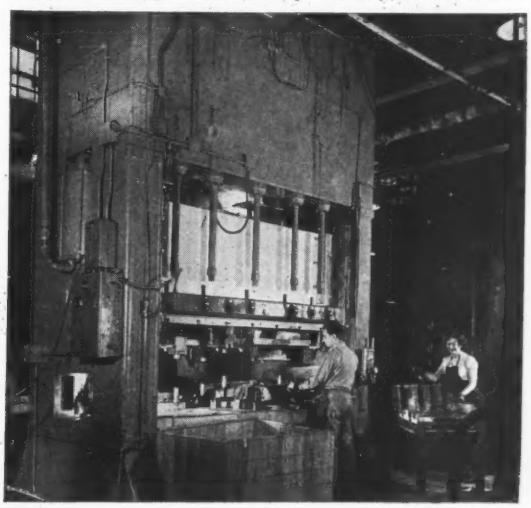
AKRON, OHIO **WYANDOTTE, MICHIGAN**



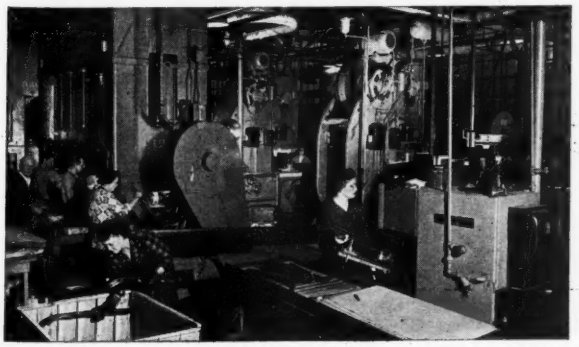
From the presses parts move on conveyors through this tunnel to be washed, bonderized, painted and oven-baked in one continuous automatic operation.

●

Huge, heavy tonnage, large-bed-area presses speed drawing and forming. Four operations can be performed at one time. Reduced handling means faster production, lower costs.



Assembly operations are closely integrated with presses. In the background three operators handle forming operations on one of the new multi-operation presses.



Listen to the Voice of Firestone on radio or television every Monday evening over NBC

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How to Help Stretch the Steel Supply

1. Tell Us All!

You'll be helping to make the most of available steel if you give your supplier *full information* when ordering. For instance, by giving us your length multiple—the cut length you will actually use, you may enable us to fill your order in "shorts." Moreover, when we know your multiple, it may be possible to ship pieces that will cut with minimum waste, thus reducing your scrap loss. Whenever possible, also give alternate gauges, sizes and qualities that may be used when your exact requirement is not available.

2. Make It Last!

Because breakdowns may necessitate replacements not readily available under present conditions, extra care of machinery is essential. With only a little more than routine maintenance, such as proper painting and lubricating, the useful life of plant property and equipment may be prolonged.

3. Turn in Your Scrap!

To keep record steel production rolling the mills must be fed a constant flow of scrap. For every ton of steel produced, at least a half-ton of iron and steel scrap is needed. Now is the time to comb your plant for old, worn-out, or outmoded machinery and equipment—anything that constitutes "heavy melting" scrap—and turn it back into channels of use. Your Ryerson representatives will gladly advise you on how best to sell your scrap quickly and profitably.

Our organization is constantly on the watch for ways to make more steel available to our customers. While our stocks are currently out of balance from a size standpoint, we do have a large tonnage of carbon, stainless and alloy steels on hand for quick shipment. So call us when you need steel, and we will work closely with you.

RYERSON CERTIFIED STEELS®

RYERSON STEEL

STEEL-SERVICE PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • DETROIT • CINCINNATI • CLEVELAND
PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO

Copper: New Stopper in CMP?

Some 55,000 tons in production of the primary metal have been lost because of strikes since July 1. Shortage will hit consumer durables

LOST: 55,000 tons of primary copper production from July 1 to now because of labor walkouts.

That estimated deficit in U. S. crude primary output may be enough to throw the Controlled Materials Plan for a further loss. Up to now, distribution of copper—and aluminum—has gone forward relatively smoothly under CMP compared with steel. Copper now promises to be as serious a distribution problem as steel, all because complete labor peace in the copper industry has been virtually nonexistent ever since July 1.

Far-Reaching — The effects of strikes are even more serious than the figure of 55,000 tons indicates because some plants tied up accounted for U. S. crude secondary production or for refined output from imported crude copper. One big loss resulted from intermittent walkouts that began July 2 at American Smelting & Refining Co.'s Garfield, Utah, smelter, the biggest in the U. S. A nationwide strike in the industry ran from Aug. 27 through Aug. 31. Kennecott Copper Corp. made peace by Sept. 1. Although a court order late last week put a stop to the rest of the walkouts, full-scale production is only now resuming.

The copper lost through strikes is gone forever. The worst hardship cases were relieved by borrowing from the Munition Board's copper stockpiles, but all that material must be returned from future production. Public information on stockpile figures is not available, but the copper tonnage is guessed as being 500,000. Domestic production can't be increased much from the pace in the first half before strikes brought chaos. A little more domestic output could be squeezed out eventually, but not in the short term. There's little hope of increased imports.

Promising — U. S. crude primary copper output in the first half of 1951 hit 498,138 tons, the best half-year performance since the World War II period. The second half production won't touch the first six-months' rate and total 1951 output will do well to match the 1950 performance of 940,249 tons.

Refined copper imports amounted to 641,000 net tons in 1950, a figure that won't even be approached in 1951 because much of the tonnage last year came in on a one-shot basis from Japan and Norway which had large inventories. What's more, the foreign price of copper—27½ cents or more a pound—is higher than the price ceiling in the U. S.—24½ cents a pound. To add to the problem, an agreement in May between the U. S. and Chile, one of our principal foreign sources, means less imports because the Chilean government is keeping 20 per cent of its production for its own use, far more than it once retained.

COPPER DEFICIT MOUNTS
. . . past strikes mean future grief

Bad News—Another source for refined copper—from scrap—is also diminishing. An unfavorable price control situation in copper scrap and the fact that less old equipment is being torn down for copper scrap means that the total amount of scrap available this year may be no more than 850,000 tons, compared to about 950,000 tons in 1950.

So, not enough copper will be available for some time. And CMP, which now controls 100 per cent of the production, will have to cut somewhere. The cutting is bound to come in consumer durable goods. The automotive industry is the largest consumer of the metal; about 50 pounds go into every car and up to 400 pounds in every truck. Appliances are another big user. They'll all get the ax.

Consumer Durables Get the Nod

The allotments of copper, steel and aluminum announced Sept. 5 for consumer durables in the fourth quarter don't reveal any unexpected slashes, but NPA says the schedule was worked out before the extent of the copper strike could be realized and drastic changes may be necessary.

NPA is already preparing a flexible "preference" list of uses to which copper will be diverted at the expense of other scheduled uses if the supply proves inadequate to meet the fourth quarter allotment.

The ABCs—The amount of controlled materials made available for production of consumer durable goods in the fourth quarter are: 984,793 tons of steel products, including 950,308 tons of carbon steel, 24,400 tons of alloy and 10,085 tons of stainless; 53.9 million pounds of copper products, including 42,550,000 pounds of brass mill products, 8.9 million pounds of wire mill products and 2,450,000 pounds of foundry products; 59,000 pounds of aluminum.

Subject to any changes dictated by the copper situation, those metals will go for consumer durables broken down into two classes: Class I includes the most essential consumer durables such as electric light bulbs, safes and vaults, shelving and lockers, food products machinery and similar products; class II includes 50 or 60 less essential classifications such as domestic appliances, paper clips and pipe organs etc. Allotments to the first group were made as close as possible to 100 per cent of the base period. Allocations to group two are more severely cut.

Curtailed—Group two, on the average, will get in the fourth quarter only 58 per cent of the carbon steel it received in its base period (the first half of 1950 or the last half of 1949), compared with an average permitted usage during the third quarter of 70 per cent of the base period. Even less stainless and other

types of steel will be doled out. The copper allotment is based on an average of 54 per cent of the base period; about 46 per cent for aluminum.

Consumer durable goods makers can purchase "free area" material for October production because suppliers can't work in much of the consumer durable needs in time to deliver for October. But those October purchases will be charged against the manufacturers' fourth quarter allocations. Yet another consumer durables modification—this one still in the works—would permit manufacturers more latitude to use their alloted materials to meet changing consumers' needs.

The amounts of the controlled materials made available for consumer durable goods production are:

	Steel (tons)	Copper (lbs)	Aluminum (lbs)
Mops & dusters	1,379	39,620	104,256
Canvas products	5,000	.....	290,000
Frames for mirrors and pictures	600	130,272	17,400
Wood household furniture, non-upholstered	2,000	1,510	1,900
Wood household furniture, upholstered	10,900	.....	.....
Reed and Rattan furniture	120	.....	.....
Metal Household furniture	42,942	106,600	1,302,000
Mattresses & bedsprings	23,068	5,000	30,500
Wood office furniture	635	3,000	.....
Metal office furniture	45,123	100,520	1,411,000
Public building furniture	16,529	61,334	555,000
Professional furniture	20,875	440,300	818,700
Metal partitions, shelving & lockers	48,413	56,100	300,000
Cases, cabinets, counters & other fixtures	6,777	47,316	475,000
Venetian blinds	35,500	130,272	3,637,517
Restaurant furniture	3,335	20,200	167,000
Furniture & fixtures, NEC	120	1,000	.....
Flat glass, except plate & sheet	190	11,945	64,327
Tinware (except cans, cooking & kitchen utensils)	7,386	.....	174,000
Cutlery	2,283	161,270	11,600
Razors & blades	1,223	334,485	.....
Vacuum bottles & jugs	1,669	31,447	474,545
Casket hardware	2,859	28,935	4,400
Domestic heating stoves & space heaters	22,178	230,388	157,288
Domestic cooking stoves, ranges & appliances except electric	58,337	662,805	558,909
Commercial cooking & food warming equipment, except electric	7,367	486,000	650,000
Enameled cooking & kitchen utensils	8,436	.....	8,964
Enameled products, NEC	16,665	.....	.....
Incandescent & fluorescent portable lamps & shades	2,706	728,800	203,400
Incandescent hand portable lighting equipment	646	1,366,600	76,000
Nonelectric lighting equipment	670	298,647	31,636
Wire Products NEC	11,600	2,224	17,400
Safes, chests & bank vaults	8,907	301,900	45,300
Lawn mowers	12,760	87,475	1,000,000
Commercial dishwashers	1,351	460,000	50,000
Food products machinery	2,087	300,000	750,000
Household washing machines	38,175	1,566,000	4,695,000
Household laundry equipment, NEC	11,734	181,700	265,000
Sewing machines	1,896	62,400	451,600
Vacuum cleaners, household	4,073	817,200	2,296,000
Household refrigerators	122,171	6,397,000	7,084,000
Home & farm freezers	19,162	703,000	554,000
Floor waxers & polishers	86	23,400	54,500
Electric fans, except industrial type	5,740	695,000	614,000
Small household electric appliances, except fans	11,292	2,305,000	4,372,000
Household ranges, electric	36,313	872,199	1,271,782
Commercial cooking & food warming equipment	2,820	240,000	336,000
Electric lamps—bulbs	3	17,000	14,000
Primary batteries, dry	1,900	623,000	.....
Lamp components	312	3,008,000	750,000
Electrical products, NEC	106	480,000	72,000
Motorcycles, bicycles & parts	19,148	260,346	372,000
Silverware & plated ware	1,660	3,492,800	696,000
Pianos	525	256,840	141,000
Organs	412	142,640	41,000
Piano & organs parts & materials	600	15,428	2,000
Musical instruments & parts	65	376,280	20,000
Games & toys	35,026	352,960	490,000
Dolls & stuffed toy animals	400	.....	.....
Baby carriages, etc.	5,100	2,000	150,000
Sporting & athletic goods	16,997	1,122,330	850,000
Pens, mechanical pencils & pen points	1,862	1,534,000	276,000
Lead pencils	.....	236,944	.....
Marking devices	365	780,000	250,000
Costume jewelry, findings & cases	3	3,304,000	100,000
Metal buttons & parts, civilian type	718	173,333	43,300
Brooms & brushes	1,135	128,383	77,744
Morticians' goods	10,950	326,960	19,800
Signs & advertising displays	18,700	488,064	250,000
Umbrella frames & canes	4,500	.....	100,000
Hospital enameled ware	1,200	.....	.....
Soda fountain equipment	452	120,815	18,718
Cooking & kitchen utensils (except enamel)	9,602	490,081	13,841,000
Galvanized ware	21,513	.....	.....
Drapery hardware	3,625	113,610	24,650
Fireplace equipment	1,740	773,612	1,450
Carpet sweepers	691	1,000	4,218
Spring wire	23,300	.....	.....
Etched products	1,208	640,000	466,000
License plates	6,000	.....	60,000
Porcelain electric products	14,614	250,000	750,000
Metal fastening devices	7,528	7,770,532	764,400
Glassware	71	5,000	95,000
Church goods	406	188,814	42,182
Office supplies	6,227	.....	.....
Highway signs	1,264	32,501	152,182
Electric razors	145	56,834	.....
Smoking accessories	.....	.....	200,000
Mirrors	.....	12,364	.....
Corset steels	334	3,000	.....
Squeegees, etc.	18	51,920	.....

NOTE: NEC after certain product groups means Not Elsewhere Classified.

Appliance Output Going Down

Westinghouse Electric Corporation's unit production of large and small electrical appliances will be 40 per cent less next month than in September, 1950.

J. H. Ashbaugh, vice president in charge of the electric appliance division, said the cutback was made necessary by National Production Authority restrictions on the use of essential materials for civilian products.

Slash in Structurals

Only direct military and aluminum expansion orders will be filled in the fourth quarter

HALF the steel expansion program and three fourths of the general industrial expansions will be delayed due to scarcities of structural steel.

Only direct military expansions and the aluminum program will get all the structural they need. General commercial construction will be cut back to 11 per cent of that projected.

That is the construction picture following fourth-quarter allotments of structural steel by the Defense Production Administration.

Too Little—Demand for structurals for the fourth quarter is 223 per cent of what DPA figures will be available. When defense production officials faced up to the task of dividing the available supplies, they allotted 100 per cent to direct military requirements and to the aluminum expansion program. All other demands were scaled down sharply.

The result is that the steel expansion programs will receive only 51 per cent of needs, general industrial expansion programs will get 26 per cent, and commercial construction will receive 11 per cent of needs for the fourth quarter.

The Pie Is Cut—Criteria used in making the allotments was in this order of preference:

1. Facilities under construction to make products urgently needed for Defense and the Atomic Energy Commission.
2. Blast furnaces scheduled to be completed before or in 1952.
3. Steel producing and finishing facilities to be completed this year.
4. Steel producing of finishing facilities owned by small concerns scheduled for completion before mid-1952.
5. Other steel facilities scheduled for completion by mid-1951.
6. Selection of facilities in order of greatest production per ton of structural steel required.

Only Deferred—DPA Chief Manly Fleischmann says that the projects

which will not get structural steel for fourth quarter are not being denied—only deferred. They may get the required steel in the first quarter of 1952.

Following table shows the amounts of structurals requested, allotted, and percentages of requests allotted, in net tons:

	Stated Requirements	Allotment	P.C.
Direct Military			
Army	4,059	4,059	100
Navy	7,306	7,306	100
Air Force	31,273	31,273	100
Metals Exp.			
Aluminum	19,010	19,010	100
Iron, Steel	174,957	89,468	51
Ferroalloys	15,514	12,719	82
Refractories	8,736	6,578	75
Foundries	3,883	2,815	72
Other Industrial Exp.	121,723	32,515	26
Commercial Constr.	106,574	12,055	11

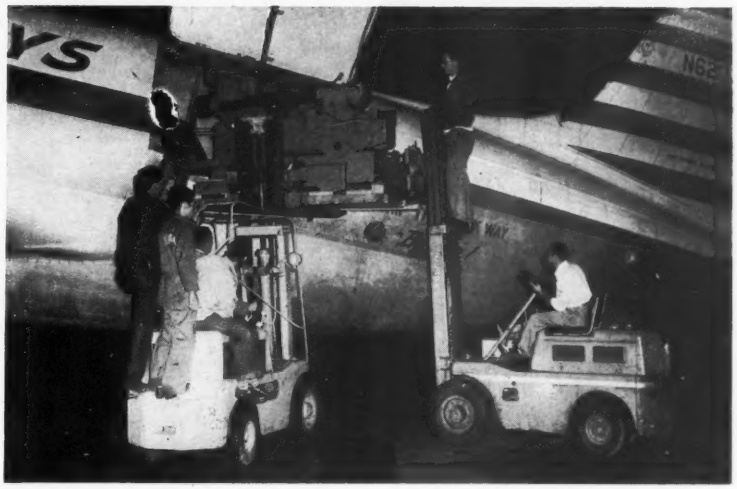
Steel Expansion Third Finished

More than one-third of proposed construction for the expansion of iron and steel facilities is expected to be completed by Oct. 1, says NPA.

NPA bases its report on figures submitted by 67 iron and steel companies which have certificates of necessity for rapid tax amortization. The figure shows that of nearly $2 billion in added facilities planned though 1953, more than $618 million worth of construction will be in place by the end of this month.

At the end of the first quarter of this year, $378 million worth of construction was complete, the study shows. By the end of the second quarter that figure rose to $419 million.

The agency says that the aluminum expansion program, which started later than the steel program, is moving well but emphasis so far has been on steel. Of a total $501 million proposed for the aluminum expansion program by the end of 1953, more than $72 million worth of construction is in place.



SKY'S THE LIMIT: Urgent demand for machine tool delivery was emphasized by Reid Brothers Co. Inc., Beverly, Mass., when it shipped a production lathe to Cleveland. The 2½-ton 9-inch machine tool, weighing 6000 pounds, was loaded aboard a plane, flown to Cleveland, unloaded and trucked to Warren, O., where it will be used by Mullins Mfg. Corp. for operations in manufacturing shells

Machine Tools from Europe May Ease Shortages Here

THAT LONG waiting list on toolbuilders' order books is causing many metalworking companies to take a second look at foreign-built machine tools. They have to fill gaps in their production lines and can't wait two years for deliveries of domestic units.

At least two teams of experts representing large American firms have appeared at the European Machine Tool Exposition that was held in Paris Sept. 1-10. These groups have been given free reign to buy turret lathes, engine lathes, milling machines, grinders and various other hard-to-get equipment — if quality proves in any way comparable to equivalent American machines and if repair parts service can be assured. Some 60 English, French, German and other European companies displayed their products at the Paris show ending today.

Here, Too—In the meantime traveling exhibits of European machines are being staged in American industrial centers. One held in Cleveland last week included a high speed geared head lathe built in the U. S. zone of Germany, a Danish universal milling machine and a crank shaper built in The Netherlands. The lathe was designed by Germany's Dr. Schlessinger, well-known in American machine tool circles.

Machines on display appeared to be quality units, though they lacked the fine finish of domestic models. Marked American influence was noted in their design. Relatively low prices quoted are attributed by importers to low labor rates abroad. American observers are more inclined to credit Marshall Plan aid for this situation.

Balance of Trade — German lathes are said to be coming into the U. S. at a rate of about 30 a month. This represents a major output slice of the Frankfort plant where they are made. Their importer claims there has been a sensational revival of machine tool building in Western Germany.

British Line Up Tool Orders

Orders for more than $9 million worth of British machine tools have been placed with British Industries Corp. for delivery within the next two years. Already arriving in this country are some machines needed for arms work, including lathes, millers, radial drills, automatic screw machines and shapers.

The British are having allocations and delivery problems though.

Irwin Lubalin, Machinery Division head of British Industries Corp. is back in England on his third trip this year expediting orders from American manufacturers.

Prices of British machine tools landed here, including duty, freight and servicing, are comparable to prices of American machinery.

Heavy Load on Wire Rope

You can get deliveries on some sizes quickly but popular types take up to eight months

HEAVY LOADS are being borne on wire rope these days. The industry that produces wire rope is swinging a heavy load too—and with consummate ease.

Manufacture of stranded and braided rope, cable and slings occupies about 50 metalworking companies. A handful of these turn out the bulk of total output, though. They are the large integrated companies with wiremaking facilities. Handling equipment such as hoists and cranes uses a lot of wire rope; other applications include bridge and highway guard cable and control equipment.

Magic Touch—Expectations of 30 to 50 per cent better business in '51

are common in the industry. Strangely enough, demand today is just about on a par with that of a year ago—but demand at this time last year was tremendous too. Buying gained momentum soon after the outbreak in Korea and rolled to a peak in the fourth quarter of 1950 and first quarter of 1951. But makers of wire rope aren't too much concerned about orders tapering off slightly: They have enough to do already to keep them busy for the rest of the year.

You can get delivery on some sizes of wire rope within a month, others little before seven or eight months. Backlog of all sizes averages about four months. Shipment promises on sizes from ½ to ⅞-inch are tough to get. That is the most popular size range, even in wartime.

Where It Goes—Users of wire rope are well diversified, but construction, oil field and mining operators are the more active consumers. General operating and maintenance requirements of steel and manufacturing industries take a good share of production. Shipping customarily uses a lot, but demand is nowhere near its wartime rate. Elevator requirements are off somewhat because of restrictions on commercial building.

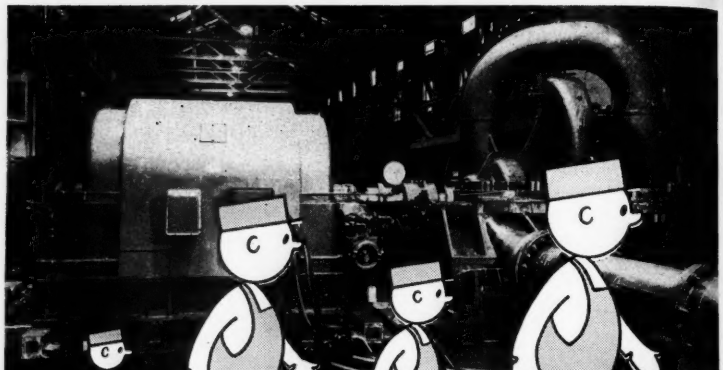
Direct military buying has increased most percentagewise over the past year, but doesn't even approach the amount taken during the war. Large producers of wire rope have as little as 10 per cent of capacity going directly to the military. Smaller companies—many of them war-born outfits not yet developed to a national scale—have been more active in driving for defense work to sustain operations. Average for all producers is close to 30 per cent. The army today is buying more wire rope than the navy; the opposite was true during the war.

On the Chin—Small producers are having a much tougher time lining up materials. That's because they're the non-integrated outfits and must buy their wire on the outside. Priced under the general freeze order, wire rope today bears the same price tag it did last December.

Heat's Off Transformers

Electric transformers one third lighter than present models may result from experiments at Westinghouse Electric Corp.'s transformer division. There a new jet spray cooling technique that dissipates heat ten times faster than present processes has been developed. First experimental unit incorporating the vaporization cooling system delivered some 350 per cent more power than normal capacity.

Production Workers in Pumps and Compressors Industry



1939	1947	1949	1951
20,063	40,358	30,888	45,000

Needed: Pump Labor

Pump, compressor industry is employing a postwar high of 45,000, but wants more

MAN THE PUMPS!

That's the cry at many of the 350 plants in the United States primarily devoted to the manufacture of pumps, compressors and related equipment. Some are having trouble getting enough manpower—especially skilled—to keep up production. That's despite the fact that estimated employment of factory workers in the industry is at a postwar high of about 45,000 (see the chart).

The Ubiquitous Pump—More labor is needed because the industry's 1951 dollar volume is running 15 to 20 per cent above that of 1950. Continued high output is necessary because the industry's products constitute one of the most frequently used classes of machinery in the world today. At least one pump or compressor is an integral piece of equipment in thousands of metalworking plants; several are in every automobile; gas and oil transmission lines require a lot of pumping equipment, as do public utilities, chemical, processing and mining industries.

The industry is producing heavily for defense although individual company experiences vary as widely as do the types of pumps and compressors made. Some firms find that as little as 10 per cent of their output is going for defense; with others as much as 80 per cent is military bound. The average is 25 to 30 per cent. Major defense users of pumps are the Atomic Energy Commission, aircraft manufacturers, the Navy for marine applications and Army Ordnance for gun mounts and general tank and automotive uses. The problem of conversion in the industry is not serious because most pumps and compressors for defense are similar to the civilian requirements.

Pressure Up—Sales of all pumps except the turbine classification were at the rate of $6.8 million a month in the first quarter. That's well above the 1950 monthly average of $4.5 million. Monthly sales of compressors in the first quarter averaged $5.9 million for a classification including stationary compressors of a wide variety, complete portables and rock drilling equipment. The monthly average for that compressor classification in 1950 was $2.7 million. Bureau of the Census figures reveal that all pump and compressor shipments in 1949 were valued at $490.2 million; $552.5 million in 1947 and $141.8 million in 1939. Total current sales figures are unobtainable because of the diversity of the industry's production and because 250 plants, in addition to the 350 that produce pumps and compressors as their major activity, turn out the products as a minor activity in conjunction with other items that account for their major operations.

The industry has materials problems, as does everyone else, but its difficulties are not seriously curtailing production. Delivery on some of the big items, such as steam turbines, may take three years, but shipments can be had within two or three weeks on the small standard pumps and compressors.

Double Trouble in Plating

Electroplaters face shortages in materials and business. Job shops hardest hit

ELECTROPLATERS face two shortages—in materials and business.

The scarcity of new orders somewhat compensates for the scarcity of chromium, nickel, copper, tin, zinc, cadmium and brass, but that's the kind of compensation which is not welcomed. Job platers are operating at only about 50 per cent of capacity. Captive shops are doing a little better, partly because they have a relatively easier time getting scarce plating materials.

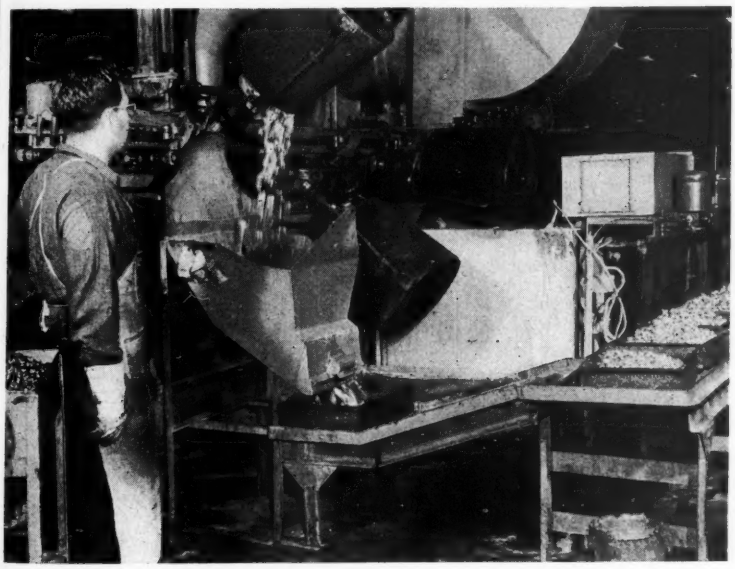
Repeat Performance—The industry wrestled with much the same situation in World War II. Then, the vague knowledge in government circles about plating caused undue suffering among established platers when the government allowed manufacturers to put in their own facilities, thus leaving the job shops out in the cold. Some 4000 job shops—about 2500 of which have more than 20 employees—will probably have sales totaling an estimated $15 million this year. That's only about 15 per cent of the total electroplating volume, and the jobbers don't want the proportion going to the captive shops to increase.

Electroplating business is off because of the curtailments on production of civilian goods, especially automobiles, and because defense applications for electroplating are not extensive. Only about 10 per cent of the average job shop's volume is now going for defense. Electroplaters, particularly the independents, are mapping a two-way program to lift themselves by their own bootstraps. They're seeking more defense applications for plating or the electrodeposition process. They're seeking to find out more about their industry, so future problems can be better met.

Fact Finder—National Association of Metal Finishers, a trade group that represents much of the industry, is doing the fact finding job on a commission from the government. It will find out how big the industry is, what equipment it has, where excess capacity is available. That will enable it to act as a clearing house for prime contracts seeking plating facilities and will help solve the duplicate facilities problem of World War II.

A tough problem is to find new defense applications. Most armament jobs now are for aircraft parts, shell and fuse components, firing pins and a wide range of ordnance items. Many job shops can go into the hard chrome field while the emergency lasts. Hard chrome plating is adapted for such products as gages. Platers' facilities may also be mobilized by greater use of the electrodeposition process for producing parts. That method is used currently to manufacture tire molds.

Platers, particularly the job shops, have one consolation: Shortages in new orders and materials mean that they don't have a scarcity of labor.



ELECTROPLATING: $15 MILLION BUSINESS FOR JOB SHOPS THIS YEAR
. . . and they will operate at only 50 per cent of capacity

Harrisburg Steel Expands

Harrisburg Steel Corp., Harrisburg, Pa., acquired the plant and business of the Boiardi Steel Corp., Milton, Pa. The action is expected to give the Harrisburg Steel Corp. a one-third immediate increase in output.

Obligations of the Boiardi Steel Corp. totaling $800,000 were retired and $19,500 in Harrisburg Steel stock was issued in the transaction.

Ferroalloy Plant Fired Up

Electro Metallurgical Co.'s new ferroalloy plant in Marietta, O., started production last week as first of a score of electric furnaces was put in operation.

First products of the new plant will be alloys of silicon, manganese and chromium, the latter including a new product for making stainless steel.

Two 40,000-kilowatt turbine and generator units have been installed. Two more will be in operation by early 1953, raising capacity of the power plant to 160,000 kilowatts. Work at the company's 800-acre site on the Ohio river was started early in 1949. The plant—one of the largest of its type in the world—represents a major share of the company's $135 million expansion program.

Carpenter Acquires Wire Works

Carpenter Steel Co., Reading, Pa., has acquired the assets of the Webb Wire Works Co., New Brunswick, N. J. The transaction becomes effective July 2, which was the beginning of Carpenter's fiscal year. The Webb plant comprises about 5000 square feet and has an operation of around $500,000 a year.

Carpenter Steel exchanged 11,450 shares of its common stock for the wire works, which will be operated as the Webb Division of Carpenter. Everett Waltman, of the Carpenter organization in Reading, will be manager of the division. E. H. Webb, president of the Webb Wire Works, will serve as management consultant for a brief period.

Jess Larson's Job

It's going to be a big one getting DMPA to take over work of GSA, ECA, DMA, etc.

IN HIS NEW JOB as head of the Defense Materials Procurement Agency (DMPA), Jess Larson has the sole responsibility for procurement of 62,-odd critical and strategic materials. And he's drawing the blueprint for the new agency slowly and methodically. He has to. Many other agencies will be affected by DMPA.

Mr. Larson's job is to get all the

materials he can for the national stockpile and for resale to defense contractors and essential civilian industries.

He is planning to buy from foreign and domestic sources and he'll direct expansion programs wherever it is necessary to get more of the critical materials.

Encompassing—The job is a big one and it stacks up like this: DMPA must take over all minerals and metals procurement from the General Services Administration, the Defense Minerals Administration, the Economic Cooperation Administration and a number of others. He is going to recruit his help from trained personnel of the aforementioned agencies. He himself will continue to head up GSA.

DMA will be pretty well wrecked in the reorganization—perhaps even completely liquidated—and its remaining activities turned over to the Bureau of Mines. It is possible, too, that it will be confined to carrying out just certain domestic mineral expansion programs. New acting adminstrator of DMA is Dr. Wilburn C. Schroeder, previously chief of the Bureau of Mines Synthetic Liquid Fuels Branch. Dr. Schroeder succeeded Dr. James Boyd (director of the Bureau of Mines) as DMA head. That all came about after a policy dispute between Dr. Boyd and Interior Secretary Chapman. Interior officials wanted to start work on a $400 million commercial size plant for producing liquid fuel from coal. Dr. Boyd didn't think research had gone far enough to warrant a commercial plant. Result: Dr. Boyd left DMA.

GSA Goes Shopping

Added to the General Services Administration's market list is domestic chrome ore and chrome concentrates —200,000 tons worth.

The chrome ore and concentrates must be of domestic origin and can be purchased from any miner or producer who has title to the material. Under the new program five tons of ore will be the minimum shipment accepted at the inspection and purchasing depot in Grants Pass, Oregon. No more than 2000 tons a year will be bought from any one source without prior written approval of the government.

Jess Larson, GSA Administrator, said that the program will end June 30, 1955 or whenever 200,000 tons have been received and accepted.

The long range goal of the program is the discovery and development of output in critical metals for defense.

THE GENERAL PATTON TANK

. . . American Locomotive says 1500 subcontractors supply parts

Subcontractors Move to Boost Share in Defense Jobs

SUBCONTRACTORS are digging their fingers deeper into the pie of defense contracts as industry strives to maintain present production schedules.

Ways and means of digging in were discussed by 100 subcontractors within the aircraft industry and Air Force procurement officials at a meeting in Washington, D. C., last week.

Proposed at this meeting was the rebuilding and distribution on an "urgent need" basis of World War II machine tools now in storage at Air Force depots at Marietta, Georgia, and Omaha, Nebraska. Another suggestion was the re-allocation within the industry to complete production lines of machine tools now leased but not being used by the present holder because of lack of other essential equipment.

A good share of the pie is held by the 1,500 subcontractors, reported by American Locomotive Co. to be producing parts for the improved General Patton tank. Some of these subcontractors are small companies with fewer than 300 workers. American Locomotive Co. announced that the new tank is now rolling off the assembly lines at its Schenectady, N. Y., plant.

Also getting a share of defense contracts are the 1765 suppliers assisting Chrysler Corp. in defense projects now on its books. An additional 3000 suppliers of parts are being lined up as the sources of Chrysler's defense production expands. The Department of Defense recently announced that Chrysler will operate a Navy-built $30 million plant near Detroit for the assembly and testing of jet aircraft engines.

Other contracts awarded by the government, in excess of $250,000, follow. Added to these are Signal Corps awards on which no quantity or value data is furnished.

Product	Contractor
Ammunition Storage Magazines	Armco Drainage & Metal Products Inc., Berkeley, Calif.
Mine Assembly and Explosive Loading Facilities	Dinwiddie Construction Co., San Francisco
Components for M31 Clusters	Ed Friedrich Inc., San Antonio, Tex.
Compressed Air Systems	Hillyer and Lovan Inc., Jacksonville, Fla.
Sets of Booster Assemblies	Federal Explosive Corp., New York
Rocket Containers	West Bend Aluminum Co., West Bend, Wis.
Rocket Motors	McCord Corp., Detroit
D. C. Motors	Servo-Tek Products Co., Paterson, N. J.
Torpedo Gyro Course Devices	Francis Metal Products Corp., Palmyra, N. Y.
Rifles and Shotguns	Ithaca Gun Co., Ithaca, N. Y.

No quantity or value data is furnished on the following:

Power Supply Units	FADA Radio Corp., Bellville, N. J.
Amplifiers	Gray Mfg. Co., Hartford, Conn.
Motor Generators	Electro-Engineering Products Co., Chicago
All Relay Dial System	North Electric Mfg. Co., Galion, O.
Interphone Equipment	Telectro Industries Corp., Long Island City, N. Y.
Radiac Meters	Kelley-Koett Mfg. Co., Cincinnati
Control Boxes	Radio Television Corp., New Brunswick, N. J.
Test Equipment	Triumph Mfg. Co., Chicago
Test Equipment	Munston Mfg. & Service Inc., Islip, L. I., N. Y.

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administrative Services Division, Temporary E Bldg., Washington 25.

Materials Orders

RUBBER—Amendment of Aug. 29, 1951, of NPA Order M-2 liberalizes certain provisions effecting manufacturers who consume rubber. Included is the elimination of all controls on consumption of natural rubber latex.

COPPER—Direction 4 of Aug. 31, 1951, to NPA Order M-11 prohibits producers of copper controlled materials from filling any orders after Oct. 1, 1951, other than authorized controlled material orders. This provides the final step in transition to 100 per cent CMP operation in copper for fourth quarter.

BRASS MILL PRODUCTS—NPA Order M-82, effective Aug. 31, 1951, enables warehouses to replace inventories of brass mill products by using allotment symbol X6 to replace products by weight which were delivered during previous month to fill DO and authorized controlled material orders. Distributors whose stocks on the last business day of the month is less than the average monthly inventory carried during the base period Jan. 1, 1947, to June 30, 1950, may place an X6 order on a brass mill for 5 per cent of the difference. The total weight of all orders designated X6 placed in any month cannot exceed 150 per cent of the average monthly weight of his base period deliveries. Order places limitations on orders brass mill must accept and on orders which distributors can accept.

JACKS—NPA Order M-83, effective Oct. 1, 1951, limits production of jacks to certain specified models, sizes, capacities and specifications. Prohibited are about 80 models and sizes now being produced.

NPA Notice

SIGNATURES—NPA Notice 2 issued Sept. 1, 1951, and effective on that date, provides that all official actions of NPA not taken in the name of the administrator or deputy administrator will be taken in the name of NPA, but countersigned by the executive secretary or the recording secretary.

Price Regulations

STEEL SCRAP—Interpretation 1 to Ceiling Price Regulation 5 stipulates that shippers of steel scrap may not use water rates in establishing shipping point ceiling prices if it has been the well-established practice to make shipments by rail. Interpretation 1 was issued Aug. 30, 1951.

DISCRIMINATION—General Overriding Regulation 18 issued by the Office of Price Stabilization permits adjustment of ceiling prices for sellers whose ceiling prices under any Office of Price Stabilization regulation involve an unlawful discrimination under the Robinson-Patman Act. GOR 18 was effective Sept. 4, 1951.

TUNGSTEN, INDUSTRIAL DIAMONDS—Amendment 10 to CPR Regulation 30, effective Sept. 5, 1951, permits manufacturers that use industrial diamonds and tungsten products in their products to add to their base period prices increases in costs of these materials from their selected base period to Aug. 1, 1951.

STEEL SCRAP—Amendment 5 to CPR 5, effective Sept. 5, 1951, establishes ceiling prices for iron and steel scrap in the United States territories and possessions.

Price Orders Await 'Go' Sign

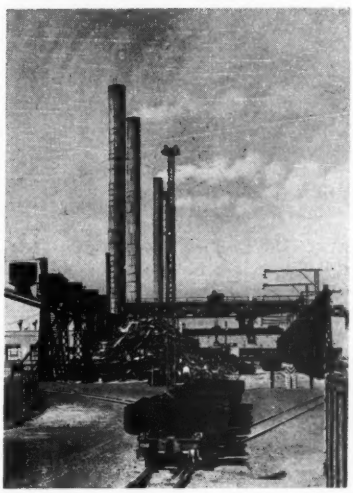
New price orders on fabricated steel products are held up temporarily at the Office of Price Stabilization, pending the action Congress might take on the President's request for repeal of the Capehart and Herlong amendments.

These amendments permit manufacturers to include in their prices all increased costs, direct and indirect, since the start of the Korean war and which permit distributors to include the same mark-ups.

Majority sentiment appears to be against repeal of the amendments, not only in the Senate Banking Committee hearings, but in the Senate and the House.

Look! No Engine

Here are a string of buggies carrying empty charging boxes from the open hearth department of Bethlehem Pacific Coast Steel Corp. plant's scrap yard at South San Francisco, Calif.



MOVEMENT WITHOUT AN ENGINE
. . . cars move by gravity

The string of buggies is given a shove from the open hearth charging floor and leaves by the track shown at the left background. The cars move by gravity until they clear the spring switch shown in foreground.

By this time, the cars have started up hill and have lost their momentum and start down toward the scrap pile.

Just as the cars leave the open hearth department they trip a switch which activates a siren. When they cross an electric eye beam, the siren automatically stops. Just as the cars enter the scrap yard, another electric eye beam turns off a red light in the open hearth building to notify the furnace operators the string of cars has arrived safely. All loading in the scrap yard is done by electro-magnet, one of which can be seen in the background.

Scrap Stays Home in Oklahoma

Using scrap iron from local sources, the first Oklahoma City-made steel was poured into ingots August 29 at the new $700,000 Hoster Steel Corp. mill (STEEL, June 25, p. 51).

Most of the output of the new mill is expected to go to Oklahoma manufacturers working on defense contracts. The state is a big producer of scrap iron, due to oil field and agricultural activities.

Castings Price Order Postponed

Effective date of the casting price order, CPR 60, has been postponed from Sept. 1 to Oct. 1. In the meantime, OPS will prepare several amendments aimed at permitting full compliance by all castings producers as of the latter date.

Western Miners Convene Oct. 22

Progress in industrial mobilization and its impact on the mining industry will be major topics of discussion when the western division of the American Mining Congress convenes at the Los Angeles Biltmore Hotel Oct. 22-24. Five general sessions and four technical operating symposia are scheduled for the three-day convention, says Harvey S. Mudd, western division chairman and general conference chairman. Attention this year will be focused on manpower problems, labor relations, wages, taxation and means of attaining expanded production to meet defense and civilian needs.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

Industrialists doing a defense stint in Washington get a better understanding of their own industries and learn how to do business with the government

MEN OF INDUSTRY who come to Washington to serve in the defense agencies usually do it at some sacrifice and personal discomfort. But once they get here it is like going for a swim in the ocean. After the shock of the initial plunge, the water turns out to be fine. It isn't only the satisfaction of doing a job with patriotic connotations: the Washington experience yields values not obtainable elsewhere.

"At home I am a sales engineer, and in my regular job I know the business and problems of my small company and what we do and can do for customers," one of these industry men told STEEL. "Here in Washington I have had a view not possible in any other way. I now am familiar with the way our competitors operate, who is who's customer, and why, and the kinds of problems they all have.

"In addition I have learned why the government does business the way it does. I used to think the government was manned by men who did not understand business and I used to call them bureaucrats. Since working with these men in Washington I have found them to be just about the same types you find in private industry —just as honest, sincere and efficient. But they have to work in accordance with specific laws, executive orders and regulations that rob them of the flexibility of the man in industry who, to meet a special situation, merely has to get a decision from his boss.

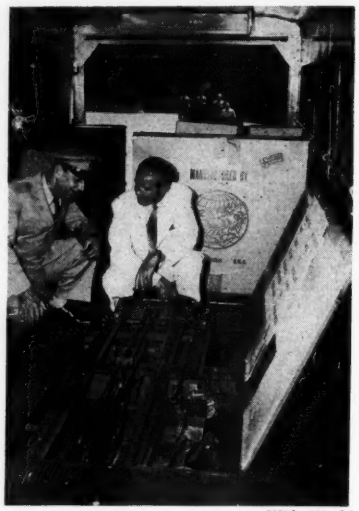
"When my turn is over I will go back to my job with an understanding of my industry, and an understanding of how to do business with the government, that I could not have gotten in 50 years back home."

A 10 Per Cent Reduction . . .

Four appropriation bills containing the so-called Ferguson-Jenson amendment were signed by the President. Under the amendment the Agriculture, Interior and Labor departments and a number of government agencies are limited to hiring one new employee for every four vacancies that will occur during the present fiscal year. Congress approved the amendment in desperation after vainly seeking administration assistance in finding ways and means to economize by reducing payrolls. Eventual effect will be to reduce the number of employees in these departments and agencies by 10 per cent.

Keep Your Fingers Crossed . . .

Aluminum users might well keep their fingers crossed about the supply of that metal in the fourth quarter of this year and the first and second quarters of 1952. Because of unusually dry summer weather, production at some primary plants was less than scheduled because of lack of water. And production at secondary plants was curtailed for lack of scrap. The situation is being studied by NPA's Aluminum & Magnesium Division to determine what action should be taken.



Wide World

MULTIPURPOSE: A new high speed vehicle soon to be put to use by the Army is the Fageol Twin Coach Convertible. It can operate separately or simultaneously as a passenger vehicle, cargo truck or field ambulance. Engine of the 35-foot-long coach can be repaired from the inside. Looking over engine construction are Col. E. A. Suttles, chief of the Highway Division Office of the Chief of Transportation, U. S. A., and Lou Fageol, president of Twin Coach, manufacturer of the vehicle

The Tax Exempts . . .

If you don't think the Truman Administration is one of the most politically minded within the memory of veteran political observers, just listen to what Agriculture Secretary Charles F. Brannan had to say to the Senate Finance Committee. The occasion was in greeting the amendment of the committee to a pending tax bill that would remove the present tax exemption on co-operatives.

"The tentative action of the committee," said he, "in voting discriminatory taxes against farmer co-operatives gives this round to the National Tax Equality Association. But it does not destroy my hope and belief that the decisive rounds to come will result in victory for farmers. . . . The government would now begin to penalize farmers' co-operatives which are successful; establishment of new co-operatives would be, for all practical purposes, prevented."

Secretary Brannan does not mention that the tax-free co-operatives have been thriving at the expense of private, tax-paying businesses whose business has suffered through that kind of competition. Nobody knows exactly how much business the farm and labor co-operatives do, but it is said to be somewhere between $16 and $20 billion a year. Incidentally, Colin Stam, tax expert for Congress, estimates that fully 50 per cent of the total income of co-operatives —or $8 to $10 billion on the basis of the above estimate—would become taxable under the amendments of the Senate Finance Committee.

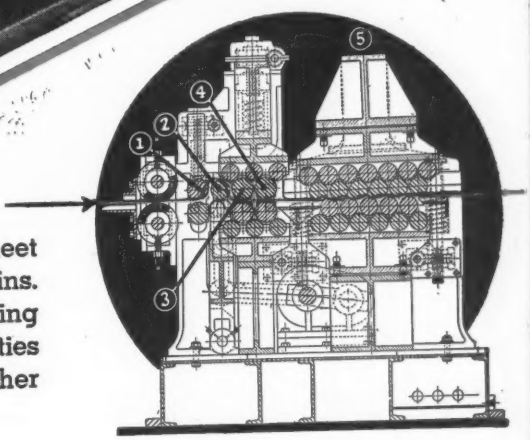
TO THE *Stamping Trade:*

IF YOU ARE PRODUCING HIGHLY FINISHED DIE DRAWN PARTS

You cannot afford to be without the benefit of a

BUDD-McKAY

PROCESSING OPERATION



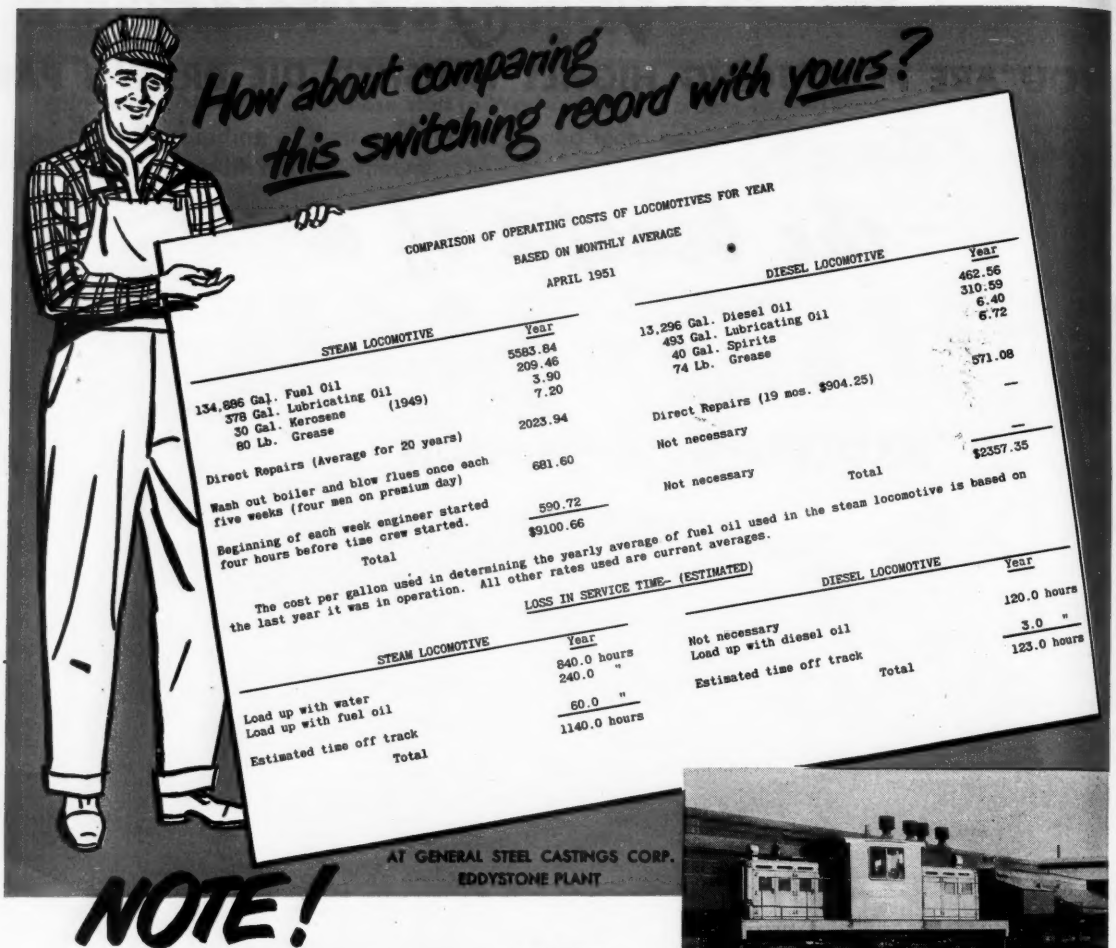
(1) Represents Hold-back Rolls
(2) Flexing Roll
(3-4) Double pair Pulling Rolls
(5) Backed-up Leveling Roll Unit

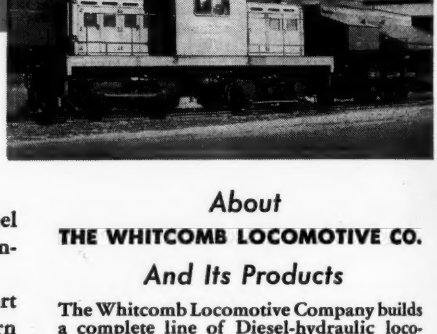
Sheets processed in the Budd-McKay Sheet Processing Machine are free of stretcher strains. For this reason they have far superior stamping and drawing qualities, and retain these qualities much longer than sheets processed by any other method.

Incidentally **HAVE YOU REVIEWED YOUR METAL FINISHING COSTS LATELY?**

The McKAY MACHINE *Company*

YOUNGSTOWN, OHIO


How about comparing this switching record with yours?
COMPARISON OF OPERATING COSTS OF LOCOMOTIVES FOR YEAR
BASED ON MONTHLY AVERAGE
APRIL 1951
STEAM LOCOMOTIVE
Year
134,886 Gal. Fuel Oil 5583.84
378 Gal. Lubricating Oil 209.46
30 Gal. Kerosene (1949) 3.90
80 Lb. Grease 7.20
Direct Repairs (Average for 20 years) 2023.94
Wash out boiler and blow flues once each five weeks (four men on premium day) 681.60
Beginning of each week engineer started four hours before time crew started. 590.72
Total $9100.66
DIESEL LOCOMOTIVE
Year
13,296 Gal. Diesel Oil 462.56
493 Gal. Lubricating Oil 310.59
40 Gal. Spirits 6.40
74 Lb. Grease 6.72
571.08
Direct Repairs (19 mos. $904.25) —
Not necessary —
Not necessary Total $2357.35
The cost per gallon used in determining the yearly average of fuel oil used in the steam locomotive is based on the last year it was in operation. All other rates used are current averages.
LOSS IN SERVICE TIME- (ESTIMATED)
STEAM LOCOMOTIVE
Year
Load up with water 840.0 hours
Load up with fuel oil 240.0 "
Estimated time off track 60.0 "
Total 1140.0 hours
DIESEL LOCOMOTIVE
Year
Not necessary 120.0 hours
Load up with diesel oil 3.0 "
Estimated time off track
Total 123.0 hours
AT GENERAL STEEL CASTINGS CORP.
EDDYSTONE PLANT



NOTE!

SWITCHING COSTS SLASHED 74%

DOWN-TIME REDUCED 89%

Annual cash savings in the switching operation at General Steel Castings Corporation up $7000! Availability of the locomotive increased a thousand hours annually!

Money-saving records like these, plus cleanliness, employee comfort and satisfaction, operating flexibility and other advantages of modern motive power, account for the growing popularity of Whitcomb Diesel Locomotives.

With material and labor costs on the increase, management today is seeking every available means to introduce new operating economies. In *your* case, perhaps, a new Whitcomb may partly solve the problem of mounting costs. When may we talk to you about your locomotive needs?

The Whitcomb Locomotive Company
Rochelle, Illinois
SUBSIDIARY OF BALDWIN-LIMA-HAMILTON CORPORATION

About
THE WHITCOMB LOCOMOTIVE CO.
And Its Products

The Whitcomb Locomotive Company builds a complete line of Diesel-hydraulic locomotives from 10 to 40 tons, Diesel-electric locomotives in weights from 20 to 95 tons and Diesel-mechanical locomotives in 5 and 8 tons.

Whitcomb Locomotives are serving industry in many countries throughout the world. For more than 40 years Whitcomb Locomotives have been establishing performance records second to none.

BALDWIN BLH LIMA-HAMILTON

YOU CAN DEPEND ON **WHITCOMB** *FOR FINE PERFORMANCE*

DIESEL LOCOMOTIVES

ECA Shifts Emphasis to Productivity

Until a while ago, ECA was exporting American things—foodstuffs, equipment—to Europe. Now, more stress will be on exporting American know-how

ECA IS aiming from a different position at its target of complete European economic recovery.

That's because the bull's eye is a little more difficult to hit now that the changed military situation has obscured the view. Until a while ago, the ECA emphasis was on the export of American things — foodstuffs, equipment, fuels—to Europe. Now the emphasis is the export of American know-how to Marshall Plan nations. Even without Russian belligerence, ECA would have shifted to more technical assistance in its last year which ends next June 30, but the change has been accelerated by the need to backstop direct American military aid.

Two Approaches—As it looks now, two major methods will be used to give technical assistance. One will be the increased use of foreign teams visiting the U.S. to get productivity tips. That procedure is already well established and will be refined. The second approach—just being initiated—will be the establishment of a pool of American engineers in Paris to help with productivity problems. Other techniques—not yet fully developed—include the setting up of training schools here to teach European technicians American methods and encouragement of more private U.S. investment abroad.

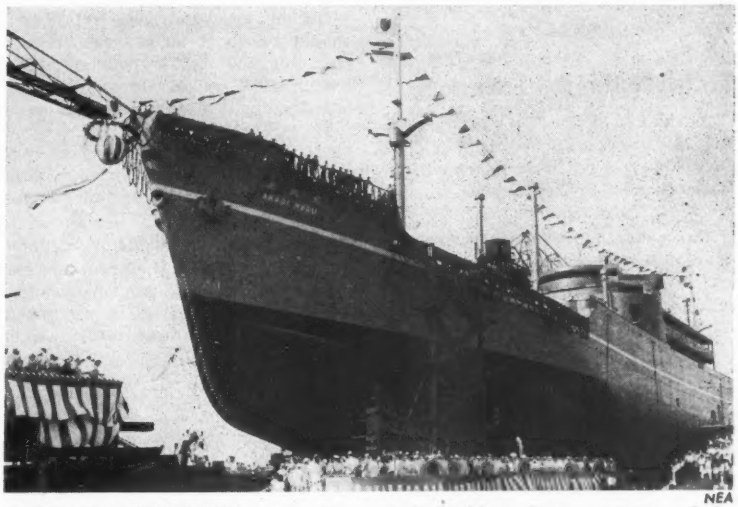
Since March, 1949, when the productivity team idea was first started, 4900 Europeans have come over here on 625 projects. The British were the first to take to the scheme and have now sent more than 100 teams to the U.S. The French got a later start, but their 100th team began a tour Aug. 26. That group is studying U. S. methods of increasing productivity in the manufacture of machine tool accessories and power hand tools. The majority of the teams from all Marshall Plan nations have represented metalworking industries. The whole program will be accelerated between now and next June 30 when 5000 more Europeans will visit this country to study productivity. In less than 10 months more will arrive than in the first 29 months of the program.

Other Side of the Coin—A corollary program to the team scheme will be the engineers' pool in Paris. For the time being just 15 engineers will be in that pool, but eventually 60 to 100 will be available. Their duties will be as trouble shooters. They'll go anywhere in Marshall Plan nations to advise and assist on productivity problems. The engineers will consist of two types: Men with top management experience and men with particular knowledge on special phases of production. A few productivity teams from America to Europe will also be used. Already several have gone across, including groups representing U.S. foundries, pressed metal companies and cotton manufacturers.

Has the productivity team plan paid off thus far? Evidence indicates yes. Deritend Stamping Co., Birmingham, England, which had a representative in a drop forging and stamping group, has achieved a 50 per cent production boost by installing the latest materials handling equipment and using American advice on the lubrication of dies. Machine Tool Research & Testing Laboratory, a French government organization at Issy-les-Moulineaux, has boosted its productivity by studying American lab methods, despite the fact that most of its 75 workers are members of CGT, a pro-Communist union that openly opposes productivity ideas. Ste. Ame John Cockerill, one of the largest heavy forging plants in Belgium, sent its Chief Engineer Adolphe Paulus on a Belgian team. One thing he learned was the economy of motion in America. Here a drop forge finishes off a product with four motions, where the Belgians use ten to get the same result. A small Dutch plant making electric fans and beauty parlor equipment boosted productivity 20 per cent in a year because of a study of American standardization of fans and motors.

Tough Nut—One of the most difficult problems facing ECA is the matter of greater U.S. investment abroad. No one has yet begun to solve it, but ECA will try. As the first step to carry out the program, the agency has appointed Wayne Chatfield Taylor as special consultant. He has been fiscal assistant secretary of the Treasury, undersecretary of Commerce and president of the Export-Import Bank of Washington. His job will be to help ECA study what it can do toward solving the difficulties.

In addition to long-range productivity programs, ECA will sponsor one-shot affairs designed to aid in exporting U.S. know-how. One such undertaking will be the visit here of more than 200 European industrialists from Nov. 18 to Dec. 4. Their visit will include a 12-day survey and discussion tour of a cross-section of U.S. plants, sponsored by ECA and arranged by the National Manage-



NEA

ORIENTAL ORIENTATION: Shipping and shipbuilding, long mainstays of the Nipponese economy, got another boost when the *Akagi Maru* was launched by the Japan Heavy Industry Co. in Yokohama, Japan. The nation's merchant fleet was skeletonized by Allied bombs and torpedoes from 6.7 million gross tons in 1941 to about 1.6 million tons at the end of the war—and only half of that was serviceable. The islands today have capacity to construct 800,000 tons yearly, and are seeking to establish themselves on a self-supporting basis

ment Council. The tour will be followed by the First International Conference of Manufacturers, a two-day session sponsored by the National Association of Manufacturers in cooperation with ECA. The conference will be held at New York's Hotel Pierre. The National Management Council, in charge of the plant tour, represents U.S. management associations and individual companies in international affairs.

Reinforcing Bars: Harder To Get

Fabricated metal concrete reinforcing bars will be changed from a Controlled Materials Plan Class "B" product to a Class "A" product Oct. 1.

For delivery on and after that date, the fabricator must obtain an allotment from his customer. Previously the fabricator received this allotment from NPA and placed orders for steel concrete reinforcing bars as controlled materials with the steel mills. He was not required to obtain an allotment from his customer who bought them from him as a Class "B" product.

These bars will have to be figured as part of the total amount of steel used in construction. This will tighten up on the use of this product. Use of structural steel has been prohibited in construction of small housing units but the fabricated bars could be used by a builder to get around the ban on the use of structurals. Furthermore, builders of large projects previously could buy the bars without controlled materials allotments and use them without adding to the project's total amount of steel.

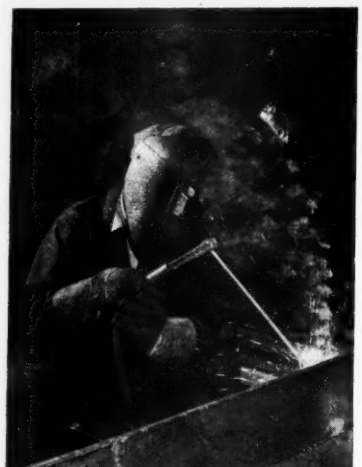
Switch Makers Ask Price Help

A tailored pricing regulation for the frog, switch and crossing manufacturers was recommended by their industry advisory committee to the Office of Price Stabilization.

To speed consideration of such a regulation, the committee appointed a four-member subcommittee scheduled tentatively to meet Sept. 11 in Washington with OPS officials.

Products of this industry are covered now by Ceiling Price Regulation 30 (Machinery). Committee members agreed that the pricing technique of this regulation is difficult to apply to the products of their industry and would distort the industry price structure. A large percentage of the units made by the industry are built to individual specifications required by railroad and industrial customers.

The industry's labor and materials cost ratios vary greatly, depending on the mechanical and metal requirements of each individual unit being produced.



BIG WELDING DEMAND
. . . heat is on rod makers, too

Big Year for Welding Rod

There'll be 50 per cent more welding rod in '51 if first half output rate continues

DEFENSE production is doing well, at least according to one good indicator of armament activity: Welding rod production.

Output of electrodes this year should be about 50 per cent higher than the 400 million pounds turned out in 1950 by 20-odd members of the welding rod industry. The estimate is based on shipments reported to National Electrical Manufacturers Association by 13 member companies representing 90 per cent of the industry's capacity.

Arithmetic—Shipments of welding rod in the first six months this year amounted to 264 million pounds, NEMA figures. In the same period last year they were 166 million pounds. Even though July turnout was only about 26 million pounds and August operations weren't up to par, NEMA will likely report shipments of over 500 million pounds in 1951. That means the entire industry will produce close to 600 million pounds of the vital rod this year—highest output since 1945. It won't be a record though: 1943 production was 1 billion pounds.

Rosy as the shipments picture looks, and despite the fact that most industry men expect business this year to be 25 per cent better than last, all is not sweetness and light within the industry. Deliveries take at least four months today and manufacturers are stymied by short wire supplies. The backlog figure is probably padded by duplicate orders on producers' books, though.

Opinion—Welding rod makers believe they could work off the backlog easily if more materials were forthcoming. They say their ability to boost production isn't limited by physical capacity; drawing, cutting and coating capacity is more than adequate, and most plants have been able to hold their workers. Industry consensus is that CMP will have long-range benefits in clearing supply channels. Welding rod has a B product listing under CMP.

Government officials take a different view on expansion of production. NPA's Welding Section, Metal Working Equipment division thinks the boost in output this year will easily be sufficient to fill demand for rod. Reasoning is that sheet steel and plate production has not increased enough to warrant any larger allocations of tight metals. Much of the hue and cry for more rod comes from distributors whose stocks are emptied soon after shipments arrive, says NPA. The agency points out that much of the shortage can be traced to emergency allocations for such projects as pipeline laying, freight car building and ship construction eating into present supplies.

History—Mild steel electrodes have historically accounted for an overwhelming portion of total production, even during wartime. The ratio of alloy rod is inching upward slowly, but the proportions haven't changed radically yet. If a major tank or shipbuilding program is initiated, it will take a lot more of the alloy types. Much research since the war has centered on development of a suitable process for welding alloys with mild steel electrodes.

For every ingot ton of steel produced in 1950, industry needed 4.2 pounds of electrode. Since 1936 the ratio has varied from 2 to 12.2 required in 1943. Today producers estimate about 7 pounds is needed per ingot ton of steel poured to fill rated and civilian orders. The formula would be better replaced, says NPA, with one based on sheet and plate production, since they are the products joined by the rod. Under that system the ratio has varied since 1936 from about 8 to 47 pounds of electrode per ton of plate, shape and sheet. Some 16 pounds per ton were used in 1950. NPA has the formula in mind when pegging output of welding rod in our part-war, part-peace economy.

Who's Who in NPA's Industrial & Agricultural Equipment Bureau

IF YOU HAVE OCCASION to get in touch with Washington for answers to questions about problems in your industry, here's a directory of key personnel and product assignments in the Industrial & Agricultural Equipment Bureau. It is the unit of National Production Authority with the responsibility for all major products of the metalworking field. Most of the names shown are those of men well-known in their respective industries, and they are well-equipped to answer any questions that have to do with production. All men are located in the New GAO Bldg., and can be seen or addressed as indicated, or can be telephoned at STerling 5200 on the indicated extensions.

NATIONAL PRODUCTION AUTHORITY

Industrial & Agricultural Equipment Bureau

New GAO Bldg. STerling 5200

Assistant NPA Administrator for Industrial & Agricultural Equipment: Franz Stone, Ext. 3391, Room 3H16.

Deputy Assistant Administrator: Frank Shields, Ext. 3391, Room 3H16.

Information Officer: Robert Burkhardt, Ext. 5146, Room 3H16.

Agricultural Machinery & Implements Division, Room 3F7

Director: Curt L. Oheim, Ext. 5105.

Deputy Director: John Ransom, Ext. 4922.

Tractor, Harvesting & Tillage Tools Branch Chief: Robert D. Merrill, Ext. 4480.

Dairy & Barnyard Branch Chief: James Crofoot, Ext. 4530.

Miscellaneous Farm Equipment Branch Chief: Robert Terry, Ext. 3703.

Construction Machinery Division, Room 3D6

Director: Myron B. Garber, Ext. 4196.

Deputy Director: Everett Wilcox, Ext. 4196.

Tractors & Tractor - Mounted Equipment Branch Chief: Ralph L. Schiesswohl, Ext. 4529.

Cranes & Shovels (except tractor-mounted) Branch Chief: D. J. Conway, Ext. 5054.

Motor Graders & Off-Highway Equipment Branch Chief: J. F. Sims, Ext. 4598.

Concrete & Bituminous Processing Equipment Branch Chief: Bob Howe, Ext. 5170.

Miscellaneous Equipment & Spare Parts Chief: William L. Davies, Ext. 5210.

Program & Requirements Branch Chief: Oren A. Prather, Ext. 5659.

Electrical Equipment Division, Room 2N14

Director: Bonnell W. Clark, Ext. 3256.

Deputy Director: Luther D. Shank, Ext. 3257.

Assistant to Director: H. E. Way, Ext. 3350.

Program & Requirements Branch Chief: C. G. Laslie, Ext. 5410.

Outside Distribution Branch Chief: D. A. Griffith, Ext. 3938.

Pole Line Equipment Section Chief: R. C. Boyles, Ext. 4260. Assistant, T. A. Bonner, Ext. 4260.

Switchgear Section Chief: R. N. McCollom, Ext. 4280. Assistants, E. J. Norrett and I. J. Kovach, Ext. 3120.

Transformer Section: L. H. Walke and G. W. Cooper, Ext. 3939.

Scheduling Engineer: E. M. McManus, Ext. 3939.

Motor and Control Branch Chief: S. H. Keller, Ext. 3947.

Miscellaneous Equipment Section: H. G. Mitchell, Ext. 4452, A. C. Tait, Ext. 3093.

Motors and Generators Section Chief: R. L. Kingsland, Ext. 3095.

Expediting Section Chief: R. C. Wareham, Ext. 3095.

Lighting & Interior Distribution Branch Acting Chief: E. S. Milligan, Ext. 5657.

Wiring Device Section: L. Alan Sharp and Thomas E. Cornell, Ext. 4117.

Lighting Equipment Section: J. H. Brundage, Ext. 4138; Hugh Estes, Ext. 4168; John N. Payne, Ext. 4129.

Engine and Turbine Division, Room 2-0-14

Director: Charles F. Kells, Ext. 4202.

Deputy Director: E. J. Hand, Ext. 4202.

Steam Turbine Section Chief: P. J. Robinson, Ext. 3937.

Boiler Section Chief: Frank X. Gilg, Ext. 4888.

Condenser Section Chief: M. J. Kilroy, Ext. 4707.

FRANZ T. STONE

Assistant NPA Administrator
Industrial & Agricultural Equipment

Hydraulic Turbine Section Chief: George Hochwalt, Ext. 4810.

Internal Combustion Engine Section Chief: R. N. Tate, Ext. 4811.

Water Softener Section Chief: E. H. Aldworth, Ext. 3310.

Heavy Metal Tanks & Pressure Vessels Section Acting Chief: George Conners, Ext. 3326.

Fabricated Pipe Section Chief: Tom Owen, Ext. 3946.

Coordination Branch Chief: E. P. Welch.

Program & Statistics Branch Chief: George Roewe, Ext. 3945.

General Components' Division, Room 3A7

Director: Samuel N. Comly, Ext. 5141.

Deputy Director: Eugene F. McCarthy, Ext. 5141.

Assistant Director: Lindsay C. Howell, Ext. 5141.

Assistant Director: James P. Baldwin, Ext. 5141.

Formed & Machined Products Branch Chief: Robert M. Smith, Ext. 4029. (Bolts, nuts, screws, washers, screw machine products, springs, stampings, etc.)

Antifriction Bearings Branch Chief: Donald M. Davidson, Ext. 4045.

Valves & Fittings Branch Chief: Charles W. Burrage, Ext. 4850. (Valves, pipe fittings, hose fittings, gaskets, packing, etc.)

Industrial Specialties Branch Chief: C. A. Goldstrohm, Ext. 4837. (Chain, marine supplies, chain fittings, wire cloth, casters and wheels.)

Mechanical Power Transmission Branch Chief: Maurice G. Jewett, Ext. 4877. (Sprocket chain, conveyer chain, gears, pulleys, clutches, couplings, belt lacing, shafting, sleeve bearings, etc.)

Tools Branch Chief: A. N. Berbatis, Ext. 4847. (Saws, files, vises, wrenches, pliers, agricultural hand tools, railroad maintenance tools, mechanical hand tools, etc.)

Program & Requirements Branch Chief: Harry S. Mills, Ext. 3676.

General Industrial Equipment Division, Room 3D7

Director: Walter E. Schirmer, Ext. 5466.

Deputy Director: William L. Beck, Ext. 4874.

Materials Handling Equipment Branch Acting Chief: Joe H. Peritz, Ext. 3860.

Special Industries Machinery Branch Acting Chief: James A. Lawson, Ext. 5704. (Food, chemical, printing, woodworking, textile and pulp and paper machinery mainly.)

General Service Machinery Branch Acting Chief: James W. Anderson, Ext. 5703. (Pumps, compressors, fans, dust collectors, industrial refrigeration machinery, etc.)

CMP Branch Acting Chief: Robert K. Oakley, Ext. 4613.

Metalworking Equipment Division, Room 3H14

Director: H. L. Tigges, Ext. 4687.

Deputy Director: P. L. Houser, Ext. 5857.

Assistant to Director: Paul S. Gaston, Ext. 4629.

Consultant to Director: Marshall M. Smith, Ext. 4687.

Adviser to Director: Swan E. Bergstrom, Ext. 4629.

Industries Branch Chief: Paul W. Norris, Ext. 4827.

Materials & Components Section Chief: Joseph G. Fitzgerald, Ext. 3262.

Abrasive Products Section Chief: Ralph O. Anderson, Ext. 4779.

Cutting Tool Section Chief: Wiley T. Buchanan, Ext. 5285.

Precision Measuring Instruments Section Chief: E. J. Masterson, Ext. 4803.

Welding Equipment Section Chief: Dale Spoor, Ext. 4814.

Foundry Equipment & Supplies Section Chief: Francis E. Fisher, Ext. 4804.

Metal Tool Cutting Section Chief: Fred Crosby, Ext. 4827.

Machine Tool Forming Section Acting Chief: Paul W. Norris, Ext. 4827.

Industrial Heating Equipment Section Chief: Carl L. Ipsen, Ext. 4813.

Wire Drawing & Rolling Mill Equipment Section Chief: Joseph G. Fitzgerald, Ext. 3262.

Light Power-Driven Equipment Section Chief: Herbert A. Newman, Ext. 4802.

Machine Tool Attachment & Accessories Section Chief: Oscar Iber, Ext. 4802.

Tools, Dies, Jigs, Fixtures Section Chief: P. R. Marsilius, Ext. 4801.

Production Control Branch Chief: Thomas I. Shriver, Ext. 5708.

Pool Order Section Chief: Robert M. Husband, Ext. 5909.

Program & Requirements Branch Chief: John Gibbons, Ext. 3978.

Used & Available Tools Section Chief: William S. McCormick, Ext. 4200.

Order Board Section Chief: E. Payson Blanchard, Ext. 4506.

Priorities & Distribution Section Chief: Harry F. Hawkins, Ext. 4370.

Diversion & Substitution Section Chief: Edgar Grossman, Ext. 4130.

Motor Vehicle Division, Room 3H16

Director: Courtney Johnson, Ext. 5495.

Deputy Director: Robert Cass, Ext. 3472.

Assistant to Director: Fred L. Glover, Ext. 5521.

Assistant to Director, and CMP Officer: George R. Davis, Ext. 3471.

Transit Vehicle Branch Chief: William J. Cummings, Ext. 3763.

Automobile Branch Chief: George R. Curtis. Ext. 3851.

Trailer Branch Chief: Elbert J. Lucas, Ext. 3751.

Truck Branch Chief: Raymond H. Fussell. Ext. 4161.

Engine Branch Chief: Thomas H. Stambaugh, Ext. 3689.

Replacement Parts Branch Chief: Lawrence Beerman, Ext. 5537.

Automotive Maintenance Equipment Branch Chief: Arthur R. Laney, Ext. 3868.

Priority Assistance & Tax Amortization Branch Chief: S. Elmore Rucker, Ext. 5746.

Railroad Equipment Division, Room 3H12

Acting Director: Robert L. Glenn, Ext. 5184.

Deputy Director: Mat K. Tate, Ext. 5185.

Locomotive Branch Acting Chief: Frank J. McShalley, Ext. 3913.

Rolling Stock Branch Chief: Stanley Brown, Ext. 3913.

Transit Branch Chief: David A. Depue, Ext. 4755.

Maintenance of Way and MRO Branch Chief: George Sitten, Ext. 3024. Assistant Chief for MRO: Francis H. Winget, Ext. 4043. Assistant Chief for Maintenance of Way: C. S. Roberts, Ext. 3024.

CMP Branch Chief: Lewis Malcolm, Ext. 3470. **Assistant Chief for CMP:** Albert J. Wolken, Ext. 4679.

Mining Equipment Division, Room 3E7

Director: H. A. Montag, Ext. 5017.

Deputy Director: L. M. Case, Ext. 5018.

Rock Machinery Branch Acting Chief: Paul R. Moyer, Ext. 4430.

Coal Machinery Branch Acting Chief: Glen R. Parker, Ext. 4470.

CMP Section Chief: O. J. LaBell, Ext. 4320.

....the "BIG BOOST" in tooling....

From "The Osbornite" published by and for the Employees of the Osborn Manufacturing Company, Cleveland, Ohio.

Chuck Corwin reads greeting card rigged up by co-workers on his new Bullard Cutmaster.

Quality, Production, Get Big Tooling Boost

How would you like to get a 16-ton Christmas present? That's what happened to Chuck Corwin (Machine Shop). Such a gigantic piece of equipment was this gift, that Chuck decided he'd have to leave it here at the plant where he could enjoy it during the day's working hours.

Now 32,000 pounds worth of heavy machinery is a very unusual kind of Christmas present for one man, but in the case of Chuck's new machine—the big 36" Bullard Cutmaster, all of us can get a lot out of it in more ways than one.

Installation of this major piece of plant machinery can be counted on to consolidate more firmly our ability to produce more. It can handle tooling of larger parts than we have been able to make up to now so it will increase the scope and range of the Moulding Machines we can sell to our customers. And that, in turn, certainly benefits us all.

Without getting too technical, we'd like to tell a little about what this new Bullard can do and how it does it. First, let's take that designation, "36". It refers not to the size of the machine itself, for anyone can see that it takes up space from the floor almost to the ceiling of the Machine Shop. Thirty-six inches refers simply to the size of the working table on which the machinist tools his metal. This Bullard will turn, bore and face Moulding Machine parts at speeds ranging from four revolutions per minute all the way up to 210 r.p.m. You can have two tools in work at one time on this mill by using the side jack and the turret head simultaneously.

Yes, we can all expect great things from this Bullard Cutmaster which, incidentally is the third such mill to be installed recently. One of the others has a 54" table for tooling even bigger parts for our Moulding Machines. All are controlled in the hydraulic system by solenoid action, and accommodate the newest type carbide tooling.

THE BULLARD COMPANY
BRIDGEPORT 2, CONNECTICUT

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom

The eight top body designs awarded prizes in Fisher's contest show nothing particularly radical in styling or rear engine construction is desired by young America

DETROIT

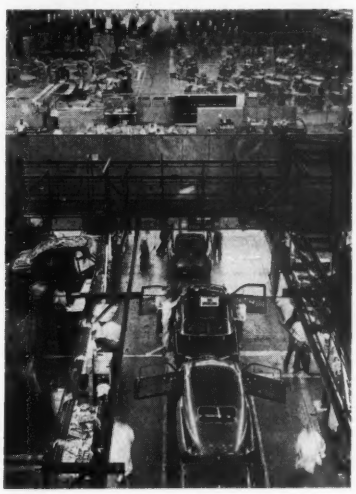
LOOK at the model cars designed and built by the eight youngsters who were top winners in Fisher Body's Craftsman's Build Guild contest and you will realize that automobile styling has reached a plateau.

One thing is immediately obvious from the prize-winning entries: Cars of the nearby future will not be significantly different looking from today's. The hard-top convertible's lines and glassiness are evident, there are no indications that "tear-drop" styling or rear engine design is desired by young America. All of the winning models are notable for their lack of freakishness.

Echo—Listen, too, to Kaiser-Frazer's vice president in charge of engineering, Dean Hammond, discussing "tomorrow's car." He indicates that the present type of reciprocating engine will be in use for some time. It will be in materials where the biggest change from today's car will come.

Stop expecting any drastic reduction in overall size of height from present designs. The passenger's comfort and safety is being considered today more seriously after the interlude during which bumped heads and cramped legs were secondary considerations.

Mass Market Counts—You can bank on the fact that sport cars of the Nash-Healey and Crosley Hot-Shot variety will have a substantial following among youngbloods and the not-so-young who have the wherewithal to indulge their whims and whose practicality has been overshadowed by the urge to be different. But this type of car will never get far beyond the plaything stage. General Motors could sell dozens, possibly hundreds, of its "Le Sabre." But it couldn't sell them to most of the people who buy Chevrolets and it is doubtful that many Cadillac buyers would be more than remotely tempted.



DOUBLING UP: Hundreds of milling and fabricating machines for aircraft work form a background for Kaiser and Henry J trim assembly line in this 2000-foot bay at Kaiser-Frazer's Willow Run plant. K-F's aircraft program includes making Fairchild C-119 cargo and personnel planes, Wright R-1300 aircraft engines and components for Lockheed naval patrol bombers

America's mania for speed can pretty well be satisfied with cars available today. In safety men's opinion present-day cars are traveling faster than road conditions permit, and even the lowest powered automobiles can be driven to within 20 mph of the most powerful. If uniqueness is sought, it's obtainable with no effort in such cars as the Muntz Jet or by using ingenuity in custom conversions, the term applied to handmade modifications of standard models.

Emphasis on Engineering—This is not to say that the automotive industry's engineering and styling sections have assumed static roles. The former is more dynamic now than at any previous time. Research work being done by nearly all automakers is at a peak, and has branched out into fields quite distantly removed from automobile problems. Examples of this preoccupation with engineering and basic research are at hand all around Detroit; i.e., Ford staffing its new scientific laboratory with top-notch men whose interests have ranged from refrigeration to isotopes; General Motors rushing construction of its technical center; Packard, General Motors and others expanding their proving ground facilities.

Defense Damper on New Models

Defense activity has put a damper on some of the new model work. It has moved some important changes in body and engine design and execution back a year, and in some cases has resulted in their shelving entirely. New model introduction dates are extremely hazy for nearly all makers. The usual November-December-January hustle-bustle when makes of the big three usually get into dealers' showrooms may stretch out over several more months. One new car—Willys five-passenger moderately small (109-in.) wheelbase car—continues to be an enigma. Orders for some of the components of this car were followed recently by cancellations and although President Ward Canaday tells stockholders that the car will be produced, he is not saying when. Rumor early this summer was that September was the month, now late in the year appears to be a better bet.

Ford Appearance a Secret

Ford is making a move aimed at keeping the looks of its 1952 cars a secret. It is building an eight-foot high brick wall flanking its Dearborn test track.

There used to be a fairly lively traffic in pictures of Fords before their introduction date, Fords being exploited more than most other makes because of the ease with which they could be photographed from the heavily traveled road

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which adjoins the track. Other car makers don't have quite the same problem, their models are tested in less conspicuous places.

K-F Peek-a-Boo Different

Kaiser-Frazer is playing peek-a-boo of a different sort. Like the rest of the industry they have new models, about which they are being very close-mouthed at the moment. They are more inclined to talk about development work of a longer-range nature. It's been no secret that they are doing a great deal of experimental work with aluminum, although more is known about their aluminum engine research than their light-weight body experiments.

John Hallet, executive vice president, says the engine program has been under way for four years and embraces tests on valve-in-head four and six-cylinder designs and V-6s and V-8s of various horsepowers. The research "may ultimately provide a saving in engine weight of over 50 per cent and substantial gains in performance and fuel economy," he asserts. Aluminum is envisioned for engine blocks, cylinder heads and clutch housings. One especially notable aspect of the K-F program appears to be its interest in four-cylinder engines. Demand for the four-cylinder Henry J., says Mr. Hallet, discloses a vast growing market. He points to registration figures as proof that they have caught on, citing a doubling in sales of four-cylinder cars in the U. S. in a year's time.

One all-important reason for there being no chance of a mass conversion by the automobile industry to all-aluminum construction for bodies in the near future is supply of that material. According to K-F researchers, the industry's requirements would be in excess of aluminum producers' peak output, but their thinking is that possibly in ten years time, aluminum will be *the* metal. To scoffers who mention the cost factor, an aluminum producer's remarks to another automaker are worth repeating. Said he . . . "You give us the order for sheets to make blank million blank cars, and the price will be competitive with steel."

Auto, Truck Output

U. S. and Canada

	1951	1950
January	645,688	609,879
February	658,918	505,593
March	802,737	610,680
April	680,281	585,705
May	695,898	732,161
June	653,673	897,853
Six Mos.	4,137,195	3,941,878
July	527,502*	746,801
August		842,335
September		760,847
October		796,010
November		833,784
December		671,622

Week Ended	1951	1950
Aug. 11	97,351	182,965
Aug. 18	129,661	190,879
Aug. 25	139,115	179,042
Sept. 1	139,553	188,072
Sept. 8	105,000*	149,742

Sources: Automobile Manufacturers Association, Ward's Automotive Reports. *Preliminary.

There may be more to the rumor about one automaker helping finance an aluminum producer's expansion than someone's overactive imagination.

Hudson Gets Defense Job

Tip-off that Hudson had received a new defense contract was to be found in the "help wanted" pages of Detroit papers. The ad read "Artist, perspective—to make pictorial illustration for airframe construction." Days later the company announced it had received an offer from Glenn L. Martin Co. to engineer, tool for and manufacture rear fuselage and tail sections for the B-57 Canberra jet bomber, the plane which ten days ago set a new unofficial record for the Atlantic crossing, bettering the record set in February by the same British-designed ship.

That's the second defense order for Hudson. In May it received an order for major components of the R-3350 reciprocating engine from Wright Aeronautical Corp.

The company will use existing facilities in Detroit for these two orders. It expects to devote about a quarter million square feet to them and according to A. E. Barit, president, the defense work will not interfere with automobile production schedules.

The Canberra was originally designed by English Electric Co., Ltd. as a high altitude radar bomber. The U. S. Air Force plans to use it as a "Night Intruder."

While tooling up for these contracts, the company also will be building its new "hard-top". Named the Hollywood, the new body design retains all the other Hudson features and incorporates the surrounded-in-glass appearance which has made this style popular beyond all precedent.

Center posts have been eliminated to give the vision and airiness which characterizes this type of styling. The model is available in the Hornet, Commodore Custom and Super-Six Custom series.

Plymouth Has One, Too

Somewhat comparable with Hudson's new airframe contract is that which Chrysler Corp. booked for its Plymouth Division, Evansville, Ind., plant. Hulls for the Grumman Albatross amphibious air rescue plane are to be built there, and final assembly has begun now on the first complete unit. Portions of all major subassemblies are in production and more than half of the heavy fixtures needed for the job have been received.

Getting ready for this work has meant several changes in the Evansville facility. For one thing, structural changes have had to be made to accommodate the 60-foot long, 8-foot wide and 12-foot high hull. It weighs more than two tons. Rather than build a new structure to house the defense work it was decided that the Plymouth suburban body would be farmed out to Briggs at Evansville, thus freeing about 2,000,000 square feet of Plymouth's plant for the operation. The other 300,000 square feet in the facility will continue making passenger cars.

Presently engaged on the Albatross project are 700 workers, a number which will about double when volume output is reached.

The Albatross contract and other defense work which Chrysler is undertaking has resulted in the addition in the last three months of more than 500 companies to its list of suppliers, Joseph Pfeiffer, director of purchases, announces.

Keep Your Scrap Moving

The obligation of steel manufacturers is to produce as much steel as possible within the limits of sound engineering and the over-all needs of economy. *You can help meet this obligation.* Scrap . . . to the tune of millions of tons . . . will be needed to keep abreast of the present demand. Save your scrap and sell it as soon as possible to your local dealer.

Symbol of Quality in

ELECTRIC FURNACE STEELS . . .

Hot Rolled
Forged
Annealed
Heat Treated
Normalized
Straightened
Cold Drawn
Machine Turned
Centerless Ground

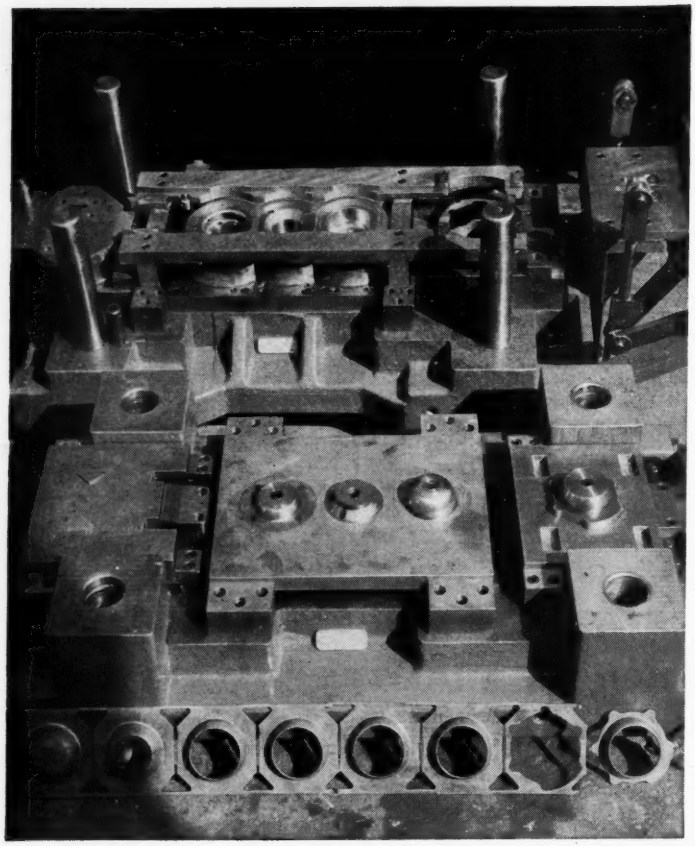
STANDARD STRUCTURAL ALLOY
BEARING QUALITY ALLOY TOOL
SPECIALTY NITRALLOY
CARBON TOOL
MAGNAFLUX-AIRCRAFT QUALITY

●

COPPERWELD STEEL COMPANY
WARREN, OHIO

117 Liberty Street, New York, New York
1578 Union Commerce Bldg., Cleveland, Ohio
528 Fisher Building, Detroit, Michigan
176 W. Adams Street, Chicago, Illinois
7251 General Motors Bldg., Detroit, Michigan
3104 Smith Tower, Seattle, Washington
P.O. Box 1633, Tulsa, Oklahoma
403 W. Eighth Street, Los Angeles 14, Calif.
Monadnock Building, San Francisco 5, Calif.
4004 Navigation Blvd., Houston 3, Texas

Graph-Mo steel in 7-stage progressive die forms heavy steel without galling



THIS die, manufactured by the Barth Stamping and Machine Works, Cleveland, is used in the automotive industry to make automatic transmission parts. It blanks, draws, forms, and punches heavy strip steel in one continuous operation.

To prevent galling of the steel parts, Barth selected Graph-Mo steel—one of four Timken® graphitic tool steels—for the forming punches and dies. Because of free graphite in its structure, Graph-Mo has outstanding low-friction properties—minimum tendency to scuff, seize, score or gall.

Graph-Mo offers many other advantages in dies and punches. It has excellent stability. It is machined far easier than ordinary tool steels. Surfaces may be finished to precision tolerances. Due to uniform response to heat treatment, distortion in hardening is prevented. And because Graph-Mo contains diamond-hard carbides, it offers unusual resistance to wear.

Timken graphitic tool steels are widely used in industry for dies, punches, gages, rolls, machine parts and many other applications. For further information write on your company letterhead for the new tenth edition of the Timken Graphitic Steel Data Book. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.

The Business Trend

Pulse of business beats faster and industrial production index inches slowly upward to its highest point since late June

FUEL under the production pot in recent weeks hasn't set it boiling yet, but there is a noticeable simmer.

Labor Day recesses will surely take their toll of production—industry is still tabulating the exact amount—but the week before was heartening to those awaiting that fall pickup in business. It showed the fastest activity tempo since the latter part of June. As measured by STEEL'S industrial production index, activity in the week ended Sept. 1 edged up to 216 per cent of the 1936-1939 average. The two preceding weeks were only slightly less productive: Revisions brought their final totals to 214.

Increase in the latest week's mark was accounted for entirely by a boost in steelworks operations. Mills in that week were again operating at capacity, STEEL estimates. All other components of the index lent the same relative weight. Last year the index was also at the 216 perch, but auto assemblies and freight car loadings were higher. These losses were made up this year by capacity steelworks operations and exceptionally high electric power output.

Rise in Steel Pourings . . .

Raw steel produced during August should total close to 7,900,000 net tons, unless actual operations again fall below weekly scheduled rates as reported to American Iron & Steel Institute. Assuming that August output approximates the estimate, domestic mills will have spewed forth close to 70 million tons of ingots and steel for castings in the first eight months of 1951—a full month's production above the 63,449,688 tons of raw steel poured in the same period last year. Schedules for the week ended Sept. 8 called for production of 1,965,000 tons.

Four Million Autos . . .

Auto production, like the activity index, is at its best level since June. Output of 139,553 car-truck assemblies in U. S. and Canadian plants in the week ended Sept. 1 is still far from the 188,072 built in the like 1950 week.

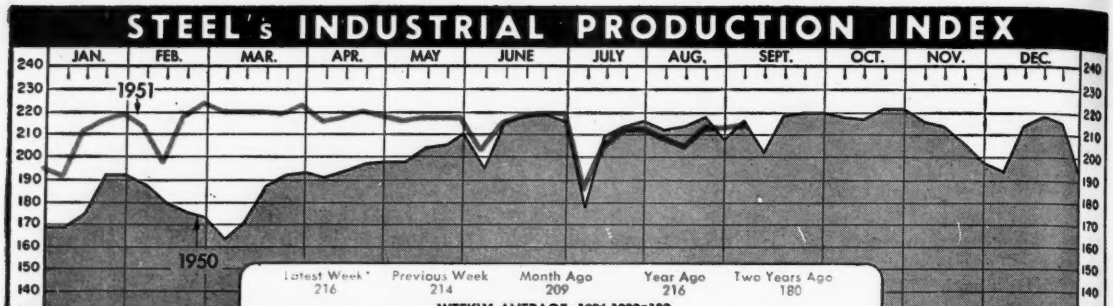
Early this week the four millionth car of the year will leave some U. S. assembly line, says *Ward's Automotive Reports*. In 1950 that milestone was reached in early August. September should see some 362,000 passenger assemblies, says *Ward's*. This would be a new low for the year and nearly 42 per cent below September, 1950. August's yield was 423,000 units. From present projections it appears that the third quarter will produce about 1,161,000 cars. If allocations for fourth quarter are unchanged, 1951 should be the second best production year in history, despite a 20 per cent drop from the 1950 performance.

Employment on Upgrade . . .

About 104,000 more people were working in August than in July, the Census Bureau reports. The increase—to 62,630,000—is only slight, the agency believes. It raises employment 263,000 above the level prevailing a year ago, and reduces the number of jobless to the lowest point

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	100.0	98.0	102.0	97.5
	Electric Power Distributed (million kilowatt hours)	7,025	7,077	7,003	6,459
	Bituminous Coal Production (daily av.—1000 tons)	1,802	1,715	1,704	1,834
	Petroleum Production (daily av.—1000 bbl)	6,240	6,220	6,201	5,760
	Construction Volume (ENR—Unit $1,000,000)	$257.4	$188.9	$267.6	$342.5
	Automobile and Truck Output (Ward's—number units)	139,553	138,797	117,010	188,072
	*Dates on request. †Weekly capacities, net tons: 1951, 1,999,035; 1st half 1950, 1,906,268; 2nd half 1950, 1,928,721.				
TRADE	Freight Car Loadings (unit—1000 cars)	835†	839	813	852
	Business Failures (Dun & Bradstreet, number)	160	130	171	143
	Currency in Circulation (in millions of dollars)‡	$28,034	$27,932	$27,842	$27,042
	Department Store Sales (changes from like wk. a yr. ago)‡	−3%	−4%	−21%	+14%
	†Preliminary. ‡Federal Reserve Board..				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$13,938	$15,210	$14,657	$16,132
	Federal Gross Debt (billions)	$256.6	$256.4	$255.6	$257.8
	Bond Volume, NYSE (millions)	$10.9	$10.1	$11.3	$11.8
	Stocks Sales, NYSE (thousands of shares)	7,357	6,103	8,538	6,698
	Loans and Investments (billions)†	$70.3	$70.3	$70.1	$68.2
	United States Gov't. Obligations Held (millions)†	$30,983	$30,949	$30,949	$34,894
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	171.92	171.92	171.92	156.99
	STEEL's Nonferrous Metal Price Index‡	224.6	224.6	225.1	205.2
	All Commodities†	176.7	176.7	177.6	167.8
	Metals and Metal Products†	188.2	188.1	188.2	174.8
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
1951
1950
Latest Week* 216
Previous Week 214
Month Ago 209
Year Ago 216
Two Years Ago 180
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
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Week ended Sept. 1

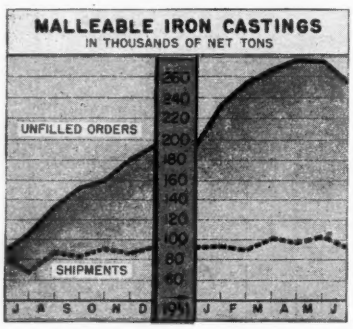
since World War II ended, if allowance is made for summer job seekers. The civilian labor force of 64,208,000 in August was below the previous month and also below August, 1950—presumably because of increases in the armed forces. Migrations of farm hands to industrial plants continued on a noticeable scale in August. Factory employment rose about 324,000, while agricultural employment dropped about 220,000.

Buyers Pessimistic . . .

The summer production decline was sharper than anticipated, but still does not match the drop-off in new orders. That's the word from the Business Survey Committee of the National Association of Purchasing Agents. Their survey of members showed that backlogs of orders have been on a steady decline for six months. Normally, the expectation of a brisk pickup in fall business would find August inventories on the rise, with lengthening forward commitments, according to the analysis. Neither of these are in evidence in this survey; inventory and materials controls may be partly responsible. Buyers believe many price increases are being held back by lack of demand and keen competition for available business. However, they warned that any sharp increase in civilian and defense demand in the fourth quarter could create a wild scramble for materials.

Manufacturers' Orders Drop . . .

New orders placed with manufacturers in July fell off 10 per cent from June, largely because retailers weren't selling as much of the goods they already had on hand, the Department of Commerce reports. A cheering note was seen, though: Total new orders of $20.7 million topped deliveries of $19.8 million that month, causing a further rise in factory backlogs of unfilled orders to

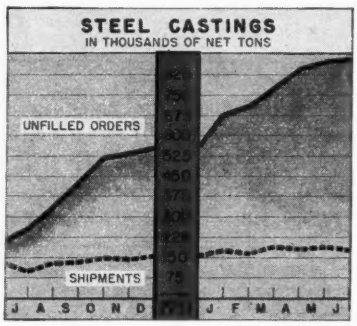


Malleable Iron Castings

Thousands of Net Tons

	Shipments 1951	Shipments 1950	Unfilled Orders* 1951	Unfilled Orders* 1950
Jan.	92.5	62.9	234	62
Feb.	89.0	60.4	255	67
Mar.	101.7	66.3	267	70
Apr.	97.3	69.8	276	76
May	100.8	76.2	275	77
June	93.7	82.3	256	87
July	...	67.5	...	105
Aug.	...	86.0	...	132
Sept.	...	82.5	...	153
Oct.	...	90.0	...	160
Nov.	...	85.2	...	180
Dec.	...	91.5	...	195
Total	...	920.6	...	...

* For Sale. U. S. Bureau of the Census.

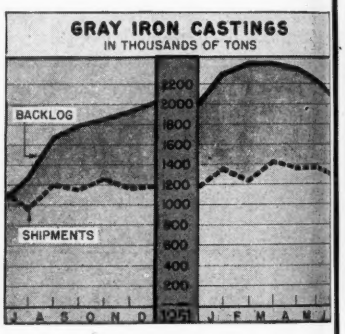


Steel Castings

Thousands of Net Tons

	Shipments 1951	Shipments 1950	Unfilled Orders* 1951	Unfilled Orders* 1950
Jan.	174.1	89.1	675.4	142.5
Feb.	164.0	91.8	707.4	165.2
Mar.	190.7	111.8	779.7	185.6
Apr.	181.9	107.0	846.9	201.6
May	189.2	117.9	881.7	198.0
June	184.7	131.1	895.1	206.8
July	....	98.3	....	255.4
Aug.	....	128.4	....	239.9
Sept.	....	134.6	....	428.0
Oct.	....	149.6	....	521.8
Nov.	....	145.9	....	537.7
Dec.	....	155.3	....	554.2

* For sale. U. S. Bureau of the Census.



Gray Iron Castings

Thousands of Net Tons

	Shipments 1951	Shipments 1950	Backlogs* 1951	Backlogs* 1950
Jan.	1,364	913	2,298	914
Feb.	1,234	864	2,392	873
Mar.	1,440	996	2,390	922
Apr.	1,363	981	2,337	922
May	1,396	1,095	2,229	978
June	1,309	1,136	2,162	1,040
July	....	961	....	1,287
Aug.	....	1,202	....	1,670
Sept.	....	1,159	....	1,794
Oct.	....	1,255	....	1,840
Nov.	....	1,161	....	1,930
Dec.	....	1,182	....	2,012
Total	....	12,905		

* For Sale. U. S. Bureau of the Census.

Charts—Copyright 1951, STEEL

$55.4 billion. Factory inventories went up $500 million in July, reaching a total of $40.5 billion. The increase was only about half as large as in other recent months.

Laundrymen Sing the Blues . . .

Caught in the mires of materials limitations and consumer resistance, makers of home laundry equipment have good reason to sing the blues. Factory sales of household washers in July amounted to 139,779 units, less than half the July, 1950 figure, and down 45 per cent from June. Automatic dryers sales dropped off 34 per cent from the month before, but were 11 per cent above the same month of 1950. Ironers sold in July aggregated 11,100 units, off 55 per cent from June sales and about the same amount under sales of a year ago.

Plant Awards Double 1950's . . .

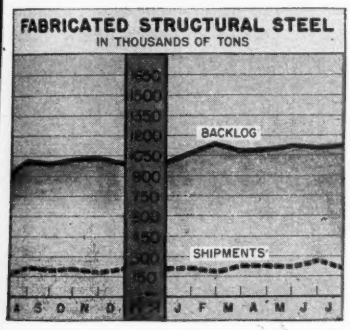
Industrial building awards at $85.2 million topped the list of construction contracts in the week ended Aug. 30, says *Engineering News-Record.* With a 35-week cumulative total of $2,876,000,000, industrial construction is now 217 per cent above the mark set in the same period last year.

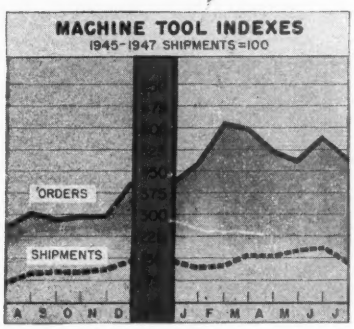
Trends Fore and Aft . . .

The electric power industry should see a further earnings decline this quarter, despite record-breaking power output. . . Work stoppages beginning in July totaled 425, the highest recorded this year. Total strikes in effect numbered 600 and caused a loss of 1,750,000 man-days in the establishments directly affected. . . Between 900,000 and 1,150,000 new television sets were in the hands of retailers at the beginning of August. Home radios at that time numbered close to 2 million. . . Consumer installment credit outstanding declined slightly in July, after showing small increases in the two preceding months. . . Industrial furnace business for July amounted to $5,507,754. . . New business incorporations in July numbered 6,386, lowest total since last November.

Issue Dates of other FACTS and FIGURES Published by STEEL:

Construction Aug.27	Gear Sales Aug.6	Ranges, Gas Sept.3
Durable Goods Aug.6	Indus. Production...July23	Refrigerators Aug.6
Employ., Metalwk. .July16	Ironers Aug.20	Steel Forgings Aug.20
Employ., Steel Aug.27	Prices Aug.27	Steel Shipments ...Aug.27
Foundry Equip. ...Sept.3	Pumps, New Orders.July9	Vacuum Cleaners ..Sept.3
Freight Cars Aug.20	Purchasing Power..Sept.3	Wages, Metalwkg. .Aug.13
Furnaces, Indus. ..Aug.13	Radio, TV Aug.20	Washers Aug.20
Furnaces, W. Air...July30	Ranges, Elec. Aug.27	Water Heaters Sept.3





Fabricated Structural Steel
Thousands of Net Tons

	Shipments 1951	Shipments 1950	Backlog 1951	Backlog 1950
Jan.	214.0	154.7	1,067	756
Feb.	193.6	149.8	1,143	780
Mar.	237.1	185.2	1,088	762
Apr.	234.1	187.8	1,093	727
May	234.5	194.8	1,121	785
June	257.1	202.4	1,111	781
July	202.4	165.5	1,135	920
Aug.	....	....	218.4	 1,009
Sept.	....	....	198.7	 993
Oct.	....	....	211.8	 1,018
Nov.	....	....	193.8	 1,034
Dec.	....	....	212.9	 1,007
Total	....	....	2,275.9	....

American Institute of Steel Construction

Machine Tool Indexes

	New Orders 1951	New Orders 1950	Shipments 1951	Shipments 1950
Jan.	475.4	99.7	114.3	52.8
Feb.	615.5	89.2	123.8	56.1
Mar.	590.3	107.4	158.9	75.3
Apr.	516.1	98.9	157.7	61.6
May.	483.0	116.4	175.1	82.5
June	558.8	124.1	182.8	91.9
July	490.6	253.1	145.0	68.3
Aug.	....	305.1	....	95.7
Sept.	....	280.6	....	101.6
Oct.	....	289.6	....	100.9
Nov.	....	291.9	....	110.9
Dec.	....	410.1	....	135.7

National Machine Tool Builders' Assn.

is spring steel up your alley?

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Pictured is just one of the aisles in Kenilworth's specialized spring steel stock department; here you see a portion of the wide variety of types, sizes and finishes (annealed or tempered) always on hand. Whatever your requirements, however small, Kenilworth can handle your orders quickly. You are assured of uniform end results plus Kenilworth's accurate meeting of specifications in shipment after shipment. Your inquiries are invited.

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TINNERMAN

Speed Nut® Savings Stories

Thomas A Edison

Cuts Costs in Half with SPEED NUTS®

Edison specifies SPEED NUTS after cost comparisons reveal 50% savings over other militarily acceptable fastening methods.

In the very earliest design stages of their aircraft fire detection relay panel, engineers of Thomas A. Edison, Incorporated, checked various methods of attaching connectors to the panel.

Their requirements were rigid. The fastening means had to be light in weight, resist vibration loosening, provide quick and easy assembly, and be in line on cost. Tinnerman Aircraft Connector Mounting Rings proved to be the only fastener that qualified on all counts. Connectors are quickly inserted through these mounting rings and the panel.

As for cost, Tinnerman SPEED NUTS *turned in the finest record by far! Easily 50% assembly savings over acceptable military substitute fasteners were provided by faster, easier, better* SPEED NUTS. Complex or simple, solving fastening problems is Tinnerman's specialty. New booklet, "A Story of Quality", reveals how we can help you. Write for your copy. TINNERMAN PRODUCTS, INC., Dept. 12, Box 6688, Cleveland 1, Ohio. *In Canada:* Dominion Fasteners Ltd., Hamilton. *In Great Britain:* Simmonds Aerocessories, Ltd., Treforest, Wales.

Cut-away view of Edison Fire Detection Relay Panel, left, shows two SPEED NUT Connector Mounting Rings in position. "U" Type SPEED NUTS, self-retained on 4 corners of ring, line up with screws driven from outside panel. Detail drawing, below, is close-up of assembly.

TINNERMAN Speed Nuts®

Men of Industry

MYRON H. EICHENGREEN
. . . a V. P. of Block Steel

ALFRED E. TREEN
. . . Houston purchasing mgr., A. O. Smith

W. S. ACUFF JR.
. . . Reynolds sales mgr., indus. goods

Myron H. Eichengreen was elected a vice president of **Block Steel Corp.**, Forest Park, Ill. He has been with Inland Steel Co. for 20 years, the last six of which he served as assistant to the manager of the sheet and strip division.

Cro-Plate Co. Inc., Hartford, Conn., elected **Alan W. Brown** as president to succeed the late **Theodore L. Brantly Jr. Robert C. Allen,** previously treasurer, was elected executive vice president and treasurer. Mr. Brown is the co-founder of Cro-Plate and as executive vice president was in charge of manufacturing and engineering operations.

Jack J. Jarms has joined **C. B. Herrick Co.**, Cleveland, as assistant sales manager. For the last five years he served Thompson Products Inc. as welding engineer in its jet division, and prior to that headed up welding sales and service for Williams & Co. in the Cleveland and Toledo, O., territory.

H. F. Roberts was appointed purchasing agent of the electrical, chassis, trim and paint department of **Lincoln-Mercury Division,** Ford Motor Co., Detroit. He returns to the division organization from its gas turbine plant, where he was purchasing agent, and fills the vacancy created by **C. S. Brown's** promotion to general purchasing agent. Mr. Roberts is succeeded at the gas turbine plant by **E. P. Byington.**

Charles E. Pritchard was appointed superintendent of all finishing mills for **Alan Wood Steel Co.**, Conshohocken, Pa. He was formerly associated with Republic Steel Corp.

Alfred E. Treen was appointed manager of personnel and purchasing at the Houston Works of **A. O. Smith Corp.** to succeed **F. B. Dunn,** resigned. Mr. Treen has been with the personnel administration staff since 1946.

John A. Hagan was appointed general superintendent of the Homestead, Pa., district works, **United States Steel Co.** He succeeds **H. G. McIlvried,** who retires after more than 50 years' service with the company. Mr. Hagan was assistant general superintendent at the Youngstown district works.

H. G. Paxton was appointed national business management manager, **Nash Motors Division,** Nash-Kelvinator Corp., Detroit. He was assistant zone manager at Detroit.

J. L. Mohun was appointed division manager, industrial insulation sales, **Baldwin-Hill Co.**, Trenton, N. J. He will be located at the new sales office established by the company at 4101 San Jacinto St., Houston.

Changes in the personnel of the sales department of **American Steel & Wire Co.**, Cleveland, U. S. Steel subsidiary, include: **Thurman Haskell,** assigned to special duties on the staff of the area manager of sales, western district, and **H. C. Hoy,** named manager of sales, Denver, to succeed Mr. Haskell, who is now located at Chicago.

Delmer Q. Bowman was appointed manager of midcontinent operations of **Earle M. Jorgensen Co.**, and will direct operations in territory served by the Dallas and Houston plants. He is also a vice president of Jorgensen.

W. S. Acuff Jr. was appointed industrial products sales manager, building products division, **Reynolds Metals Co.**, Louisville. For the last three years he was regional sales manager for the division in the New York region. Prior to joining Reynolds in 1948 Mr. Acuff spent 21 years with Keasby & Mattison Co. as salesman, district manager and general sales manager. He is succeeded as New York regional sales manager by **James C. Wolfe,** formerly regional sales manager in that area for Keasby & Mattison.

Roger S. Ahlbrandt was elected treasuer of **Allegheny Ludlum Steel Corp.**, Pittsburgh. **Clark W. King,** executive vice president, has been serving also as treasurer. Mr. Ahlbrandt was manager of stainless steel bar sales.

J. W. Peterson was appointed general traffic manager, **Air Reduction Co. Inc.**, New York, succeeding **H. W. MacArthur,** retired.

Harold Weinstein, president of **Calumet Iron & Supply Co.**, East Chicago, Ind., was appointed chief scrap adviser to Edward W. Greb, acting director of the Salvage Division, **National Production Authority,** Washington.

Charles T. McKinnie was appointed assistant sales manager of **Pratt & Whitney Aircraft,** division of United Aircraft Corp., East Hartford, Conn. He has been chief of western field engineering for United Aircraft Service Corp., Los Angeles, and is succeeded there by **John Craig Jr.**

John W. Dunn was appointed assistant to the vice president of manu-

facturing at **Bell Aircraft Corp.**, Buffalo. He formerly was vice president and assistant general manager of Frederic Flader Inc.

Albert T. Harris was appointed assistant general manager of **Buffalo Arms Inc.** and will be in charge of operations of the new plant under construction in Akron, N. Y. He formerly was general manager of International Railway Car Co. plant in Kenton, O.

Richard E. McElvain was named to **Allis-Chalmers Mfg. Co.'s** Duluth branch office as a sales representative specializing in crushing and mining equipment.

T. S. Amato was appointed manager of the subcontracting division of **American Type Founders Inc.**, Elizabeth, N. J. He was general manager of its Waverly Division during World War II.

H. E. Schrader was appointed assistant to vice president, product development and research, of **Western Gears Works** plants in Lynwood and Belmont, Calif., and Seattle; Pacific Gear & Tool Works, San Francisco; and South Western Gear Works, Houston.

John F. Moriarty was appointed to the newly created position of sales promotion manager, replacement sales division, **Cleveland Graphite Bronze Co.**, Cleveland. He has been with B. F. Goodrich Chemical Co. in Cleveland in various advertising and public relations staff capacities.

J. Terry Summers has joined **Admiral Steel Corp.**, Chicago, as vice president. He formerly was assistant manager of specialty steels as a spring steel specialist at Lapham-Hickey Co.

Joseph Ralph was appointed sales manager, **Melrath Metal Stamping Corp.**, Red Hill, Pa.

Donald W. Sawyer was appointed parts sales manager for **Dearborn Motors Corp.**, Birmingham, Mich., to succeed **Leo F. King**, resigned to become president and general manager of King-Bond Inc., a Dearborn dealership in Richmond, Ind.

Harold L. Coons, advertising manager, **Keystone Steel & Wire Co.**, Peoria, Ill., was appointed special consultant on the agricultural program of the special heavy metal scrap salvage campaign of the Advertising Council.

BENJAMIN A. MAIN JR.
. . . V. P.-engineering, Aeroquip

H. L. SCHROCK JR.
. . . Aeroquip V. P.-treasurer

Aeroquip Corp., Jackson, Mich., elected as vice presidents **Benjamin A. Main Jr.** and **H. L. Schrock Jr.** Mr. Main, vice president in charge of engineering, has been with Aeroquip since 1942 as chief development engineer. Mr. Schrock, vice president and treasurer, has been with the company since 1947.

C. W. Bryant was appointed manager of the purchasing section of **General Electric Co.'s** materials and purchasing department, Schenectady, N. Y. **W. F. Rauber** was named special representative of the large apparatus division in Washington, and **Clarence Burke** succeeds him as manager of sales, switchgear department, in Philadelphia.

John B. Madden was appointed hydraulic sales manager for the north-central district of **A. O. Smith Corp.**, with offices af 310 S. Michigan Ave., Chicago. Former product supervisor, he orginally operated hydraulic sales from the company's Houston works, where the firm's vertical turbine pump manufacturing is centered. **Hal Kern**, former district pump sales manager, Chicago, will now concentrate on distributor accounts in the field.

Edgar C. Dehne was elected assistant treasurer and assistant secretary of **Westinghouse Electric Corp.**, Pittsburgh. He has been eastern district treasury manager of the corporation at New York, and now will make his headquarters in Pittsburgh. Mr. Dehne replaces **Edward George Jr.**, retired after more than 45 years with Westinghouse.

Sundberg-Ferar, Detroit, announces that **Clair A. Samhammer** has joined the firm as a designer. He was with Creative Industries of Detroit.

Rigidized Metals Corp., Buffalo, appointed **John Hayes** assistant advertising manager. He formerly was associated with the advertising department of Trico Products Corp.

Named to head the expanded sales department at **American Box Co.**, Cleveland, is **A. R. Caputo**, formerly assistant sales manager.

Rockwell Mfg. Co., Pittsburgh, appointed **Robert B. Kitzmiller** as manager of its San Francisco office to replace **Gilbert T. Bowman**, transferred to Pittsburgh headquarters as sales manager, gas products.

Midwest Piping & Supply Co. appointed **John E. Brock** director of research, with headquarters at the main plant and executive office in St. Louis.

W. H. Bolger was promoted to manager of laboratories, and **Cromwell Bowen** to assistant manager of laboratories, **Robert W. Hunt Co.**, Chicago.

Frederick L. Murray was promoted to assistant superintendent of foundries, **Hunt-Spiller Mfg. Corp.**, Boston, to succeed **William E. Mulcahy**, recently named superintendent.

Herman F. Zorn was appointed executive vice president of **Ferracute Machine Co.**, Bridgeton, N. J. He formerly was president and general manager, V. & O. Press Co.

Oliver Smalley, president, Meehanite Metal Corp., with offices in New Rochelle, N. Y., was elected an honorary life member of the **Institute of British Foundrymen**, London.

Dr. G. Raymond Fitterer, head of the **University of Pittsburgh** department of metallurgical engineering since

American Felt performs four functions for ELECTROLUX®

TWO TYPES of American Felt are used by the makers of the Electrolux Cleaner and Air Purifier—filter and pad. The filter felt is specially designed for minimum air resistance, and structural strength. (Function 1.) It is installed at the exhaust end of the cleaner, and must pass all the air that goes through the cleaner. The felt does not clog quickly, and offers ten times as much dust retention as cloth. The filter also reduces noise. (Function 2.)

The pad felt, much more dense than the filter felt, is used under the lamb's wool buffer of the air-driven polishing attachment available for the Electrolux. It provides a flexible backing for the buffer (Function 3.) and also has sufficient friction with the buffer to prevent slipping (Function 4.) For quick assembly in the modern Electrolux plant, both filter and pad felts are supplied by American, cut to accurate dimensions. Thus felt's four functions, plus economical assembly, aid Electrolux and their customers.

● Perhaps in your product it would be possible to use felts of various types to perform several functions, separately or in combination. The services of American Felt's Engineering & Research Department are at your disposal, whether you make vacuum cleaners, machine tools, bearings, automobiles, airplanes, or other products.

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American Felt Company

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Heyl & Patterson Can Do a *Better Job*

at a *Lower Cost* to you!

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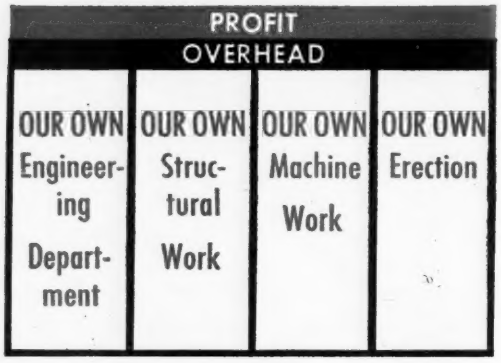
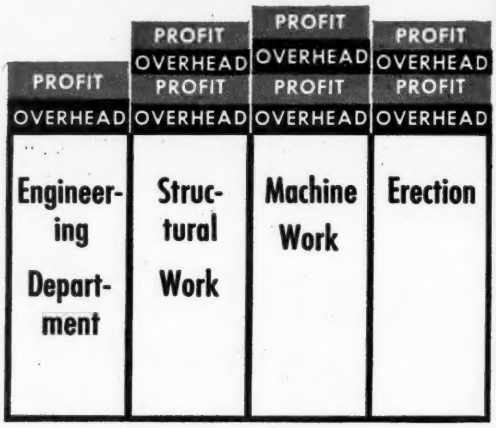


In Contrast With Other
Many Overheads...Many Profits Way



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CHARLES R. RITTER
. . . Luria Bros.' gen. traffic mgr.

PAUL L. WRIGHT
. . . sales mgr. at Ryerson's Buffalo plant

WILLIAM ZWICKER
. . . heads Nat'l Steel & Shipbuilding div.

1939, was appointed dean of the Schools of Engineering and Mines.

Charles R. Ritter was appointed general traffic manager of **Luria Bros. & Co. Inc.**, Philadelphia, dealer in iron and steel scrap. He is succeded as traffic manager by **Edward J. Bolton.**

Joseph E. Edens was appointed a member of the sales department of **Lebanon Steel Foundry**, Lebanon, Pa.

Willard H. Jones, formerly supervisor of administrative and service departments at the Madison division, **Dow Chemical Co.**, Midland, Mich., was promoted to production and economic co-ordinator of the magnesium department. **Dow Chapin** was named to the magnesium sales group of the Cleveland office.

Paul L. Wright was appointed sales manager of the Buffalo plant of **Joseph T. Ryerson & Son Inc.**, Chicago, steel distributor. He was office manager at Buffalo in which capacity he also served as supervisor of the company's inside sales department. He joined the company in 1939.

Harvey R. Cook was placed in charge of advertising and sales promotion by **Timken-Detroit Axle Co.**, Detroit, and its home heating equipment division, Timken Silent Automatic. **R. W. Smalley, A. E. Jones,** and **W. E. Featherstone** continue as assistants to the advertising manager.

M. A. Hanna Co., Cleveland, announces retirement of **Earl E. Hunner.** He served as general manager until 1946 when he became executive consultant.

William Zwicker, head of the Los Angeles sales and engineering office, **National Steel & Shipbuilding Corp.**, San Diego, Calif., was named manager of the company's structural steel division. He succeeds the late **Otto Tatus.** Mr. Zwicker continues to supervise the Los Angeles office which he has headed since it was established in 1945.

William G. Harris was- appointed personnel manager of **Pratt & Letchworth Co. Inc.**, Buffalo. He succeeds the late **Joseph Laffey.**

Edward L. Klopfer was appointed sales engineer, **Gross Machinery Co.**, Buffalo. He joined the firm last January.

George E. McLaughlin was named vice president, **Young Steel Products Co.**, Youngstown, a warehouse firm.

OBITUARIES . . .

Marion F. Crabtree, 73, open-hearth superintendent, cast armor division, **American Steel Foundries,** East Chicago, Ind., died Aug. 27. He joined American Steel Foundries in 1904 and served almost 40 years at the Granite City Works. When the cast armor division plant opened in 1942, he was transferred there.

Henry W. Crosby, chairman of the board of **Crosby Co.**, Buffalo, steel stamping concern, died Aug. 25.

Harry W. Renick, 63, vice president, **Ramapo Ajax and Brake Shoe & Castings Divisions** of American Brake Shoe Co., and in charge of their western sales operations, died Aug. 28 in Los Angeles.

Ray C. Newhouse, 76, who retired in 1945 as manager and chief engineer of the basic industries department of **Allis-Chalmers Mfg. Co.**, Milwaukee, died Aug. 27. He had been retained by the company after retirement in a consulting capacity. Mr. Newhouse gained fame as an engineer, inventor and designer of some of the world's largest cement and mining machinery.

Sydney W. Kitson, 53, manager of the public works division of **Worthington Pump & Machinery Corp.**, Harrison, N. J., died Aug 27.

Alton P. Hall, 51, former vice president and general manager of sales, **American Chain & Cable Co.**, New York, died Aug. 31.

William F. Hoffman, 75, who retired in 1946 as president and treasurer, **Industrial Wire Cloth Products Corp.**, Detroit, died Aug. 29.

W. DeWitt Tappan, inventor and consulting engineer, died Aug. 26. He was associated for many years with **Caldwell Mfg. Co.** in Rochester, N. Y.

James D. Evans, 74, vice president, **Merchant & Evans Co.**, Philadelphia, heating-unit manufacturer, died Aug. 31 in Bryn Mawr, Pa.

C. T. Yates, 63, secretary-treasurer, **E. C. Brown Co.**, Rochester, N. Y., maker of spraying equipment, died Aug. 29.

Charles A. Muse, 84, retired official of **H. C. Frick Coal & Coke Co.**, United States Steel Corp., Pittsburgh, died Aug. 27.

Clyde L. Savage, 57, vice president, **Du Page Boiler Works,** Naperville, Ill., died Aug. 26.

William H. Manning, 50, technical assistant to C. R. Osborn, vice president of **General Motors Corp.**, Detroit, died Aug. 24.

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offer these outstanding advantages:

★ 60 Types of 'Surface' burners in 600 sizes...

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★ Undivided 'Surface' responsibility from design to operation.

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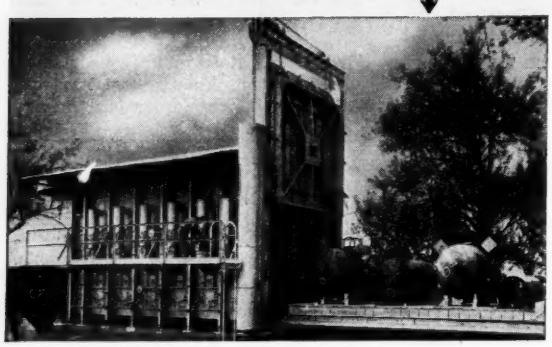
ANNEALING—*Roller hearth, direct-fired furnace for annealing brass bars, strip and coils.*

STRESS RELIEVING—*Direct-fired Car Bottom furnace for stress relieving welded pressure tank assemblies.*



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Production AND Engineering NEWS AT A GLANCE

JETS ON THE MARCH—The British take a lot of credit for the advanced stage of their engineering progress on turbojet aircraft engines, and probably rightly so since their engineers, from Frank Whittle on down, have not had to freeze designs in the interests of mass production as has been the case in America. Nevertheless, U.S. jet experts have been moving ahead rapidly in the past six years, exchanging their design refinements and processing methods to the point where wonderment is heard here and there over why it has been necessary to assign British engines to production assignments in the current defense effort here. A look at what one leading builder in this country has accomplished may prove illuminating. —p. 90

NOTES ON ALUMINUM BRAZING—Talk is heard around the motor industry of the copper shortage forcing a switch to brazed aluminum radiator assemblies, although it is difficult to believe the lack of red metal will be of such duration as to force so drastic a retooling. Aluminum can be brazed readily, if several critical factors are kept in mind. One is oxidation, which may be overcome by brazing alloys with fluxing qualities preventing oxidation. Another is weakness of the metal at high temperatures, this being licked by brazing materials which melt at temperatures as low as 400°F. Special aluminum "brazing" sheets also have been developed recently, with brazing material rolled into their surface, eliminating the necessity for applying any brazing metal in the joining operation.

TRACERS IN BLAST FURNACE—Radioactive cobalt-60 pellets, inserted at strategic points in the lining bricks of a British blast furnace, may give some interesting indications of refractory wear when experiments now under way are concluded and evaluated. As the lining wears away the intensity of the radioactive inserts lessens, measured by counters positioned outside the furnace wall. —p. 102

BRASS POWDER FOR FUZES—Powder metal fabricating plants are producing rotor blanks for shell fuze boosters of brass powder at a rate of about 1000 per hour per set of tools. The part is the first brass ordnance element to involve powder metallurgy on any extensive scale and weighs only 0.8 ounce. It was made formerly from extruded 70-30 brass bar stock. Density of the compact is 7.7, against 8.53 for the solid bar; sintering temperature must be held closely in the 880-900° C range.

ZINC PLATE STANDS UP—In a test of automotive trim hardware plated with bright zinc, then given a special chromate-type conversion treatment and finally coated with baked clear lacquer (as an alternate for conventional copper-nickel-chrome), resistance to salt spray as high as 300 hours is reported before the first signs of corrosion products. This compares with about 50 hours for the conventional chrome plate. Results consistently ran in excess of 100 hours on parts of both steel and zinc die castings. There is nothing new about this type of finish except its application to automobile trim. One objection heard to the "alternate" plating methods in which lacquer is the final coat is that the parts spot and tarnish quickly, even from drops of rain or the touch of fingers.

FLUORINE GOES COMMERCIAL—A new family of organic compounds known as fluorochemicals was delineated before the American Chemical Society in New York last week. Uses, present or foreseen, include flame extinguishers, lubricants withstanding high heat, coolants for electrical equipment, aids to electroplating, new resins, and as tools to separate and purify rare metals in atomic energy studies. Freon, Teflon, Genetron, and Kel-F are examples of the compounds. A newer one, perfluorocaprylic acid, lowers the surface tension of water to a remarkable degree, suggesting its use in electroplating solutions. Westinghouse has devised a system of cooling the innerworkings of big transformers by using a "jet spray" of liquid fluorocarbons to carry away the heat generated and thus boost power delivery by a reported 350 per cent.

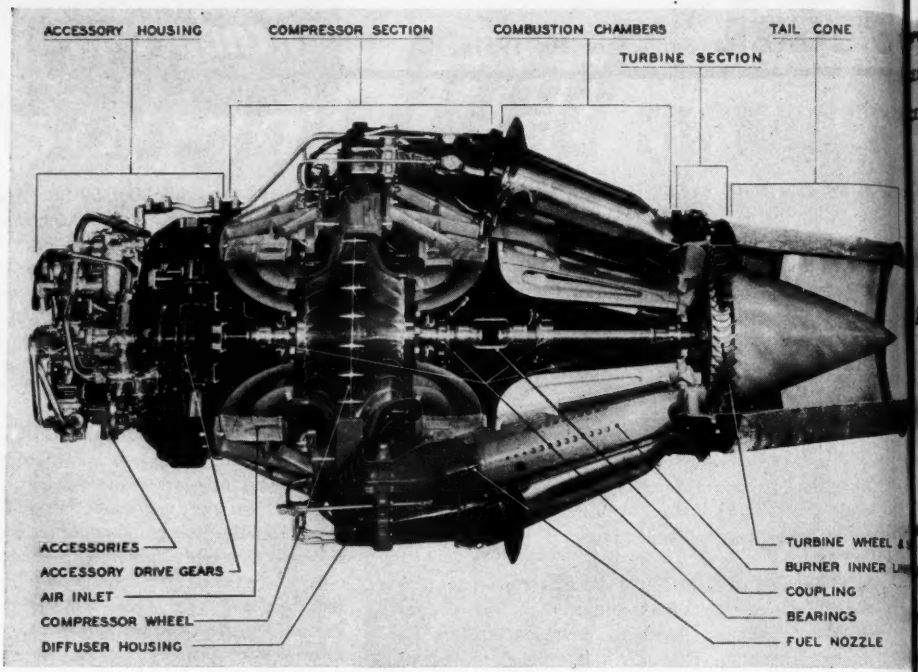
STUFF UNDER WRAPS—A "barrier" material for military packaging, consisting of aluminum foil laminated to vinyl plastic film and polyethylene film and then to scrim cloth, is in great demand for Method II preservation of engines, electrical and radio equipment, instruments, propeller hubs, guns and the like; so much so, it is reported, that production facilities for the wrapping are booked solid far into the future. —p. 98

FLASH HEATING SYSTEM—Delivering 500 heated forging billets an hour to each of two headers producing automotive hinge components is being accomplished by a gas-fired slot-type furnace with water cooled impingement burners located the full length of the 36-inch slot which has a cross-shaped section. A magazine feed and pusher keep the stock moving to the furnace and the heated slugs are delivered on a roller conveyor to the header operator in correct position for quick feeding into the dies. —p. 96

WHO DOES WHAT TO WHOM?—Some of the machinery boys were shaking their heads last week over a demonstration of European-built lathes, shapers and milling machines staged in Cleveland. Prospective buyers were promised immediate delivery from New York stocks, at prices 20 per cent under those for equivalent U.S. machines, and with no priority. The kicker was that the plants building the equipment had been financed by ECA funds! —*A.H.A.*

Metalworking Outlook—p. 53 *Market Outlook—p. 155*

Entirely new techniques of manufacture and assembly are involved in production of turbojet engines, as typified by the striking cover illustration of an Allison assembler placing one of the 11 compressor wheels in position on the shaft of an axial flow engine



Cutaway view of the centrifugal J33 turbojet engine in which air is supplied by a single forged aluminum impeller

Cultivating the Know-How of Jet En

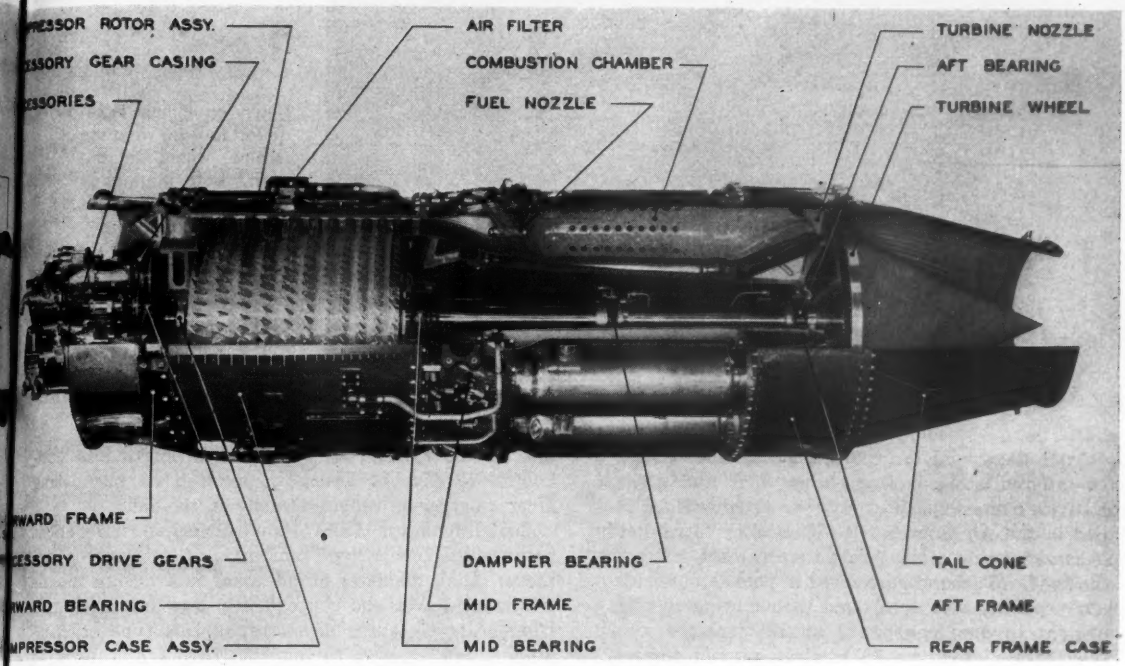
Concentration on design problems leads to improved processing methods and equipment. Result: More pounds of thrust and lower cost per pound, as the turbojets come of age

By A. H. ALLEN
Associate Editor

TURBOJET aircraft engine production, now in the throes of a terrific expansion, has called for a fairly complete upheaval in accepted methods and materials hitherto used in the manufacture of reciprocating internal combustion engines of the radial and in-line types. While the principal acceleration has come in the past 15 months, there has been a continuing program of improvement and refinement under way since the close of World War II. Nowhere has this been more concentrated than at the Allison Division of General Motors Corp. in Indianapolis which shortly will deliver its 12,000th turbojet since undertaking the first model in 1945.

Years' Experience—Allison is an old hand at engine building, dating back to 1917 when redesign of the Liberty engine was undertaken in the effort to boost its horsepower. GM acquired the company in 1928 and designers went to work on the idea of a liquid-cooled 1000-hp aircraft engine. This materialized in the form of the V-1710 engine, the first of which were rated at 750 hp and were delivered to the Navy. Steady refinements were made until the 1000-hp goal was reached in 1937. The war saw a furious production and plant expansion race underway, the result being that by V-J day, output had reached 70,000. The V-1710 and the twin design, V-3420, are now ancient history. Even spare parts bins have been cleared out to make way for the turbojets.

As to physical stature, Allison had 600 employees in 1938, burgeoning to 23,000 in 1944. Plants were expanded to seven in number, covering over 4.5 million square feet. Largest is in No. 5 in Maywood, with 2 million square feet, where turbojet engine manufacture is being centered. Current employment is better than 14,000, will approach 18,000 by year-end. The division has a number of important production assignments in addition to engines—transmissions for the M-46 General Patton and T-41 Walker Bulldog tanks; precision sleeve-type bearings for aircraft engines, locomotives and machine tools; parts for diesel



Smaller in diameter than the centrifugal engine is the axial flow J35 unit, with 11 stages of compression and eight horizontal combustion chambers

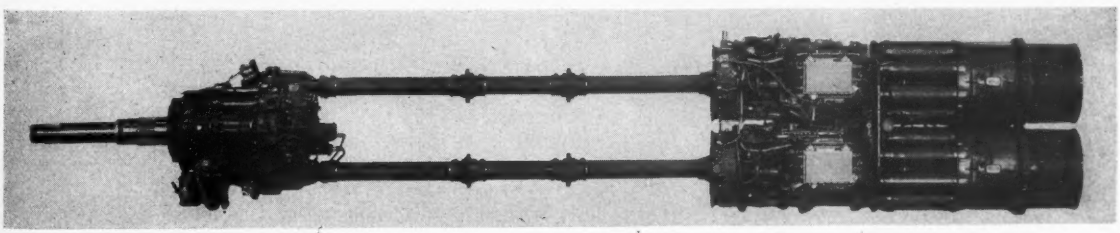
Engine Manufacture

locomotives, and heavy-duty automatic transmissions for trucks, off-the-road equipment and oil field use.

Two Engine Types—Two distinct types of turbojet engines are being built in quantity, a fact unique among U. S. manufacturers of this equipment. They are the centrifugal and axial flow designs, referring to the type of compression system used to pump air to the combustion chambers. The first has a single compressor wheel or impeller while the second has multiple stages of air compression. Cutaway illustrations of both types show the overall construction.

The centrifugal design was the first to be built by Allison and is known as the J33 model. It has gone through many stages of modification for Air Force installations, starting with the J35-A-1 and going on up, by odd numbers only, to the latest type, the J33-A-33. Models furnished the Navy are given even-number designations, such as J33-A-16. The various types do not necessarily go into production in succession, the number being assigned early in the development period and carried on through qualifying tests. Some never may see actual production, depending upon what happens during testing and upon the speed with which design changes can be assimilated.

Ten Models—The axial flow compressor engine is called the J35 and has already been built in ten models, the A-1, 3, 5, 9, 11, 13, 17, 19, 21 and 29. An A-23 model, underway since 1949, is still in the



This is the T40 turboprop power unit, comprising twin axial flow engines driving contrarotating propellers. Only a third of the turbojet power is realized at the propeller

Heavy equipment is required to flash weld the turbine wheel to the shaft, both high-alloy steel and the heart of the turbojet engine

prototype stage, and incorporates many unusual features differentiating it from other J35s and giving rise to its name Superjet. Four of them will be installed in the Air Force's YB-47C Boeing "Stratojet" bomber, delivering more thrust than the six jets now in the B-47. (Turbojets are rated in pounds of thrust, not horsepower, with one pound thrust being roughly equivalent to one horsepower at 375 mph.)

The J35-A-23 features 16 axial stages of compression with a three-stage turbine, previous J35s having 11 compression and single turbine stages. Requiring no external oil supply, it has its own complete system, as well as an integral hydraulic system to operate variable-area jet nozzles and the air inlet screens. Further, it incorporates deicing features on the air inlet vanes and the bullet nose in the air intake, heat for deicing being bled from the compressor. Air inlet screens are automatically retractable and closeoff doors are positioned in the air inlets. The "cannular" combustion section has a single-can outer combustion chamber similar to an annular type burner section, but with ten individual cans inside the outer one. Compressed air flows from the outer can into the inner liners for combustion. This unusual construction is said to improve structural strength and contribute to ease of assembly, as well as permitting inner cans to be replaced easily in the field.

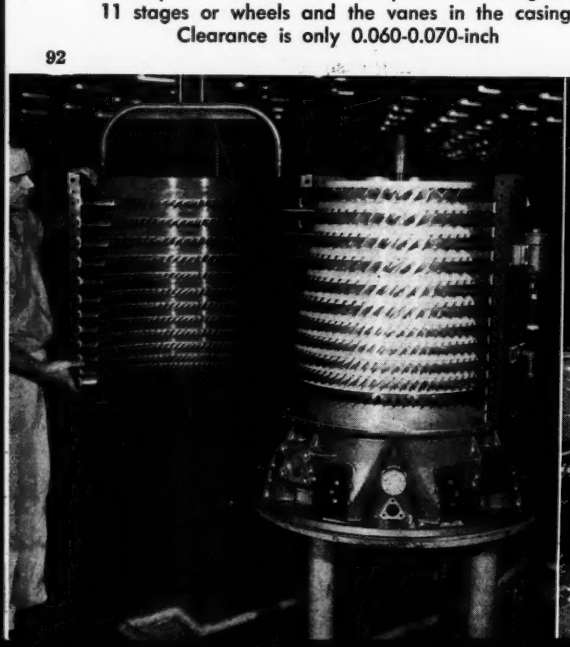
Centrifugal vs. Axial Flow—Principal differences between the centrifugal and axial flow engines are these: Small diameter of the axial flow design means less frontal area and consequently less drag in flight. Higher air pressures developed in this type of compressor are figured to increase thrust and bring a 10-15 per cent improvement in economy over the centrifugal compressor—an important gain since the jet engine is a notorious fuel hog. On the other hand, estimates indicate 50 per cent more man-hours are required to build this type of unit, making its cost appreciably higher per pound of takeoff thrust in comparison with the centrifugal compressor engine (without afterburner).

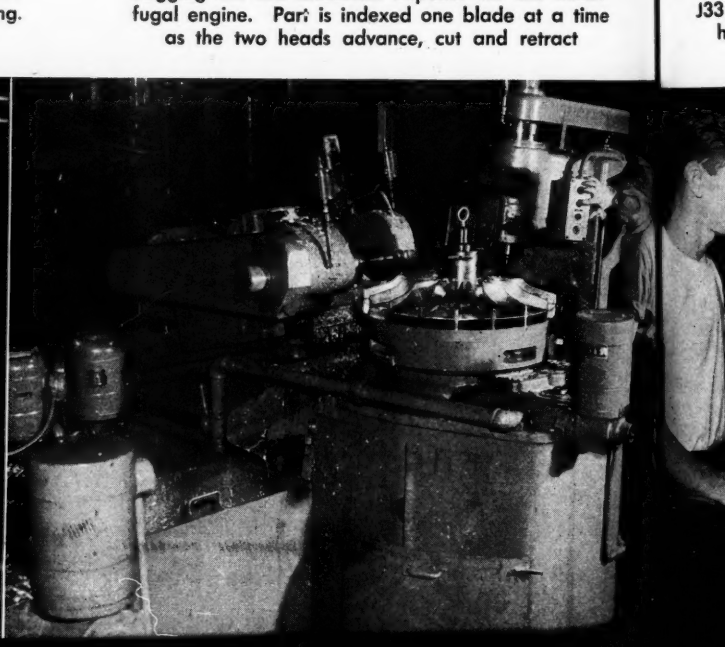
Incidentally, cost checks show that from 1947 to 1950, a reduction of 70 per cent in dollars cost per pound of thrust has been made by engineering and manufacturing attack, in spite of generally rising costs.

Navy Turboprop—Along with the expanded pro-

Closeup of the axial flow compressor showing the 11 stages or wheels and the vanes in the casing. Clearance is only 0.060-0.070-inch

Specially developed automatic milling machine for hogging out the aluminum impeller for the centrifugal engine. Part is indexed one blade at a time as the two heads advance, cut and retract





duction of the straight turbojets and afterburner models, Allison is currently preparing for production this fall another "first" in military engines in this country—a turboprop engine for the Navy. The turboprop absorbs the major portion of the available power in the turbine wheel component and through gearing drives a propeller.

With guaranteed static rating of 5500 horsepower and weight of 2500 pounds, it has twin power sections connected by extension shafts to a reduction gear driving contrarotating propellers as shown in an illustration. Each power section drives both propellers and for cruising single power sections can be declutched to save fuel. The design is claimed to be the first turboprop engine in the country to complete a 50-hour flight clearance test and the first to power U. S. aircraft without the assistance of reciprocating power plants.

3200 Suppliers—Some statistics on subcontracting for Allison turbojet engine work are interesting. Supplier list totals 3200, of which 500 are in the productive material classification. Of the full list, covering 29 states, 1800 employ less than 500 persons. For all defense production, Allison buys 88 per cent of its parts, makes the balance in its own plants. In the case of the centrifugal type turbojet engine specifically, all parts are manufactured at Allison except turbine buckets, sheet metal elements such as combustion chambers, liners, tail cones, afterburners, etc., and the various engine accessories.

No engine builder can boast more flying hours on its jet engines. The J33, rated at 5400 pounds thrust with water injection at takeoff in its latest A-23 type, and the J35, rated at 5600 pounds in the A-29 model, together with the thousands of earlier versions which have been installed in half a dozen different fighter planes, have accumulated over 1,000,000 hours of actual flight time. Some of the J33 engines are now reporting over 700 hours of service before overhaul, a figure that would have been called fantastic only a few years ago. Consider that the shaft speed of this engine is 11,750 rpm. The J35 is somewhat slower, about 8000 rpm.

New Design, New Methods—In the past five years there have been notable strides in the collective knowhow of turbojet engine design and construction, all contributing to improved performance, reliability, durability and economy. Strong emphasis is placed on the design factor, Allison for example now having an engineering department numbering 1900, the largest of any General Motors division.

New designs inevitably lead to new processing techniques. Some of these methods are developed locally, but in many cases they are worked out in co-operation with the parts suppliers.

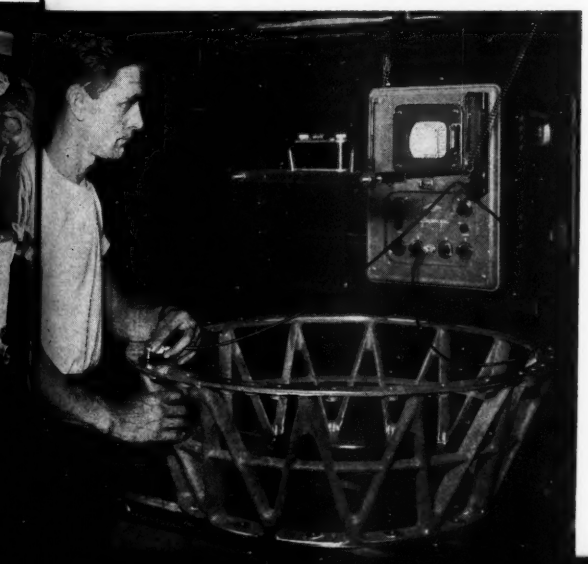
Primary metals of the turbojet are stainless and other high alloy steels, magnesium and aluminum. A typical J33 requires 3030 pounds of manufacturing material; a J35 3083 pounds. Of these gross weights approximately 80 per cent is recovered in the form of finished components. Breakdown between the three principal metals used is restricted information for some reason, but a guess might be 50 per cent steel. 30 aluminum and 20 magnesium.

Engine "Hot Section"—The turbine wheel is really the heart of the engine, for it is here that the blasts from the combustion chambers are translated into rotational power to drive the compressor, and it is here that the attack of flame and gas on metals is the sharpest. Striking advances have been made in design and materials for this element of the engine's "hot section." Precision forged turbine buckets of tough super-alloy now are produced at far less cost than a few years ago. Recovery of 50 per cent of the original bar stock is possible, against a measly 27 per cent when they were first made. Dimensional control is all-important, tolerances being as little as 0.0001-inch. Finishing techniques include automatic honing of leading and trailing edges, vapor blasting for surface smoothness, and crush grinding of dovetails (ends that fit into slots in the wheel disk).

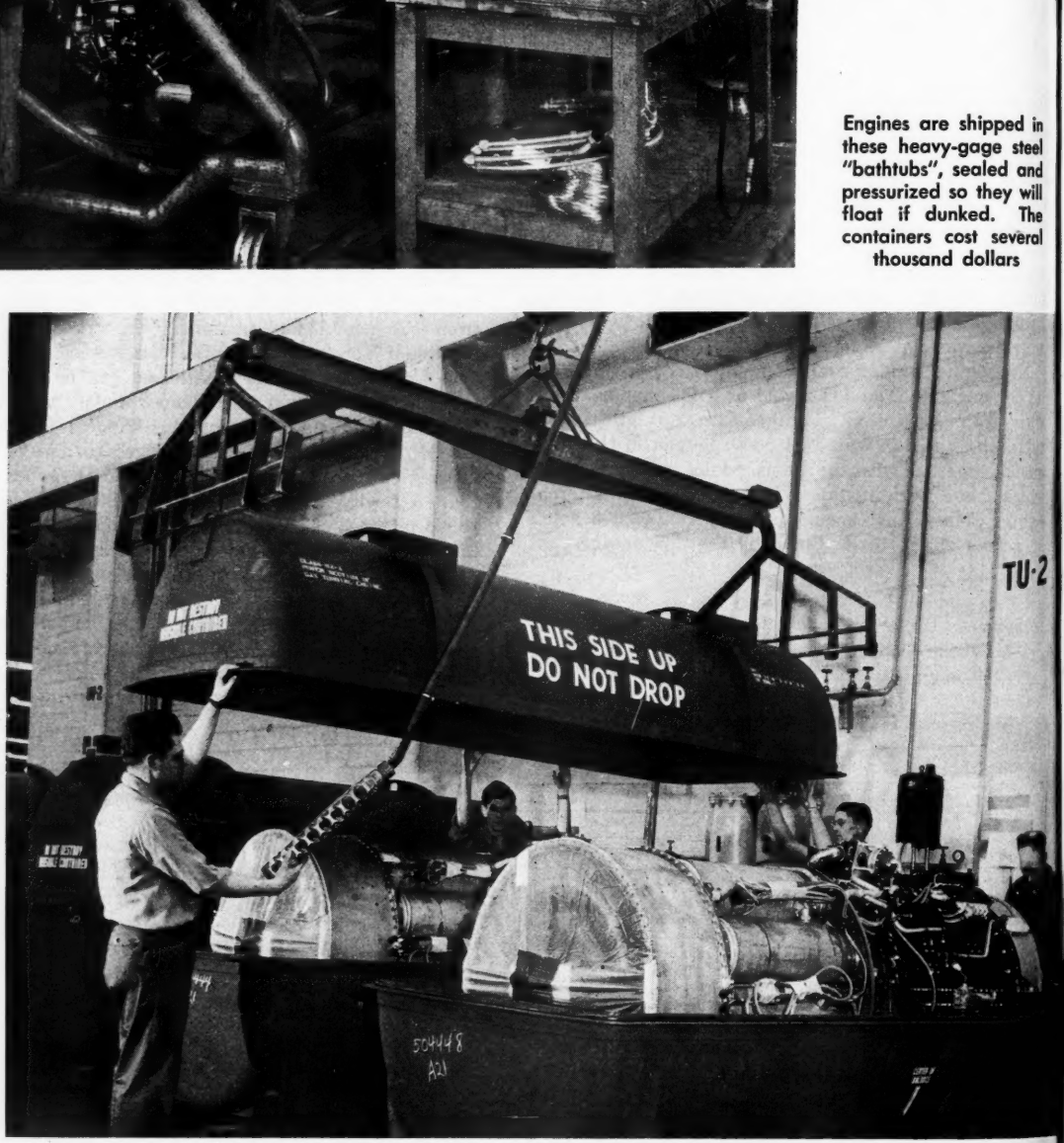
For the hot end turbine buckets forgings are at present used and, undoubtedly, will continue to be until some of the cast materials and casting and inspection processes are developed to a point where "maverick cast" buckets are eliminated. There are several cast alloys that appear potentially excellent bucket materials.

Composite Wheel and Shaft—Allison uses a composite turbine wheel and shaft, flash welded together. The wheel or disk is unusual in that it is forged from a 9-inch round ingot or billet prepared by the Kellogg process. This involves the forming of SAE 1020 steel strip into tube shape, inserting it into a copper mold, pouring the required amounts of ferroalloys into the center through metering plates and arc melting. Steel is Timken alloy 16-25-51 (chrome-nickel-iron) and by the process it can be produced to close analysis and high purity, resulting in a material with high strength and relatively high ductility. Each ingot makes a

Sonic testing a cast light metal midframe for the J33 engine to locate internal discontinuities or non-homogeneity. Equipment is the Reflectoscope



Left—Line production of J33 turbojets is exemplified here as the 14-can combustion chamber unit is lowered onto the frame assembly



Engines are shipped in these heavy-gage steel "bathtubs", sealed and pressurized so they will float if dunked. The containers cost several thousand dollars

single wheel disk, the ingot weighing 310 pounds, the rough forging 250 pounds and the machined wheel 186 pounds.

Just ahead of the turbine wheel is the nozzle diaphragm, a ring fitted with closely spaced vanes which direct the path of the 1200-1300° F gases coming from the combustion chambers into the turbine buckets at the angle for most efficient power delivery. Vanes in this diaphragm take an even hotter blast than the turbine buckets and, of course, are stationary. They are made in several types, both as to alloy and methods of manufacture. Precision investment castings and parts made by the Prym process extrusion method employing alloys of superior oxidation and corrosion resistance are used.

Close Tolerances—In compressor sections the problem of heat is not critical but the units are nonetheless demanding insofar as precision machining is concerned, particularly in the axial design where multiple stages are involved. Each succeding stage has blades of slightly shorter length as the air pressure builds up toward the delivery end. Wheels at the forward end are machined aluminum alloy forgings into which blades are dovetailed. Ring spacers separate the different stages, with the wheels splined to the central shaft. At the hot end of the compressor, where air temperature increases to 400-500° F, the compressor wheels are changed to stainless steel.

Extreme precision must be maintained in machining and fitting these wheels and their blades, since clearance between the blades and the vanes in the compressor casing is only 0.060-.070-inch. Further, design must be such that blade replacement is not too difficult. Since outside air is being sucked in and built up to high pressure, any foreign particles such as stones or bits of metal which are trapped in the air stream may easily damage or break a compressor blade and there are 1100-1500 blades in an axial flow compressor.

Some of the compressor blades are forgings. Others may be of the powdered metal type—powdered iron compacted in a die, sintered and infiltrated with copper, and finally chrome plated. A typical compressor may have as many as 600 of them.

Allison Firsts—Allison is rightly proud of the contributions its engineers have made to better and less costly turbojet engines. They have advanced numerous ideas for more economical forging of buckets; developed the design and production of compressor vanes free from critical materials; worked out machining procedures which boosted metal recovery on gear forgings to 40 per cent; devised cutting speeds, feeds and angles which raised production on broaching turbine wheels from 5 to 20 per broach. Allison also claims to be the first to use ultrasonic testing for accurately locating both structural discontinuities and nonhomogeneity in magnesium, aluminum and steel parts such as impellers, turbine wheels, frame sections and shafting.

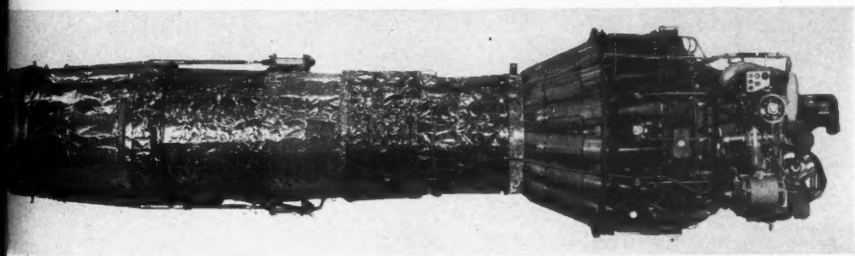
In early engines combustion chamber liners were good for about five hours. By effective redesign principally, liner life has increased to some 700 hours. Knowledge of how to weld the thin-gage stainless steel sheet used in these liners, "burner cans" tail cones, steel midframes and other strange sounding parts was practically nonexistent six years ago. Now procedures have become routine.

More Thrust—One of the latest improvements to be incorporated in the engine design is the afterburner, a cylindrical extension to the rear in which are positioned additional fuel nozzles, igniters and suitable internal deflecting rings or baffles to prevent the outward rushing gases from converging as they are enriched with fresh fuel and ignited. The afterburner provides about one third additional thrust, although it does mean literally pouring on more fuel.

The present day turbojet is loaded down with accessories, the idea being to make its functioning as nearly automatic, independent of pilot control, as possible. What is wanted is a single control lever for the pilot with all engine operating details interconnected with it. Some of the more important accessories are fuel pumps—gear type for the main nozzles, centrifugal for the afterburner, fuel controls governing on a speed-density basis, pressure switches to actuate emergency fuel pumps, starter-generator system geared to the compressor (cranking speed is about 1500 rpm), oil pumps for both compressor and turbine ends, controls for afterburner "eyelids", and an electrical system for energizing igniter plugs.

Which way now? Well the design road still beckons. More pounds of thrust per pound of weight and less pounds of fuel per pound of thrust . . . turbine wheels, nozzle diaphragms and combustion chamber liners that will stand another 100 degrees of heat . . . fewer piece parts and fewer total parts . . . easier assembly and disassembly. Allison engineers are working almost around the clock on turbojets for 1953 and 1954. They may already have reached new goals only waiting proof on the test stand.

Late model of the J33 engine, with afterburner as it appears ready for a model test. Note control arms regulating "eyebrows" on the end of the afterburner. Wrapping is a special material used to absorb heat in a test stand run



HIGH-SPEED HEATING AN

Expedites Hinge Production

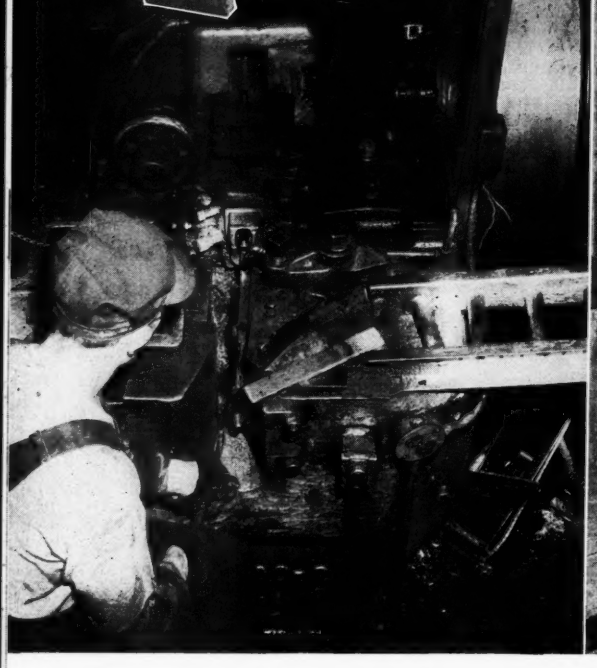
Using slot-type billet heaters fed from magazines, Dodge forge plant upsets ends on flat blanks at the rate of 1000 per hour with two headers. Partly automatic setup speeds handling

Left—Door hinge forgings, right to left, blanks, upset forging before flash is sheared off and after flash removal

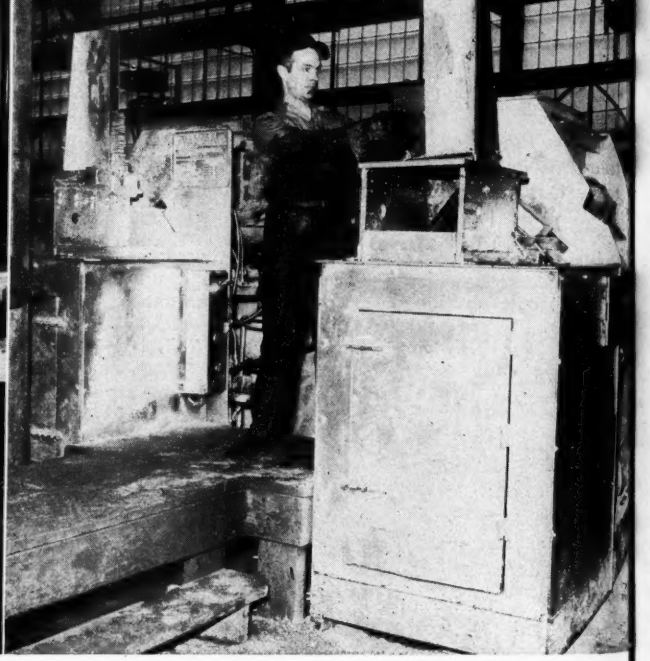
DOOR hinges for Chrysler, DeSoto, Dodge and Plymouth passenger cars are made from blanks of flat stock ranging in size from 1¾ x ⅜-inch up to 2 x 7/16-inch. One end of each blank or billet has to be upset. Forging of these hinge components is done in the company's Dodge forge plant, Detroit. Upsetting is effected in a single blow on a 1½-inch hot header. Heading produces a flash which is trimmed off in the second blow using, in the second position, high speed steel dies that do not require water cooling.

4000 per Shift—As heading and trimming of this type are simple and very rapid operations in which about 4000 forgings are produced per header in an

Below—Setup for upsetting and trimming hinge components in the Dodge forge plant. Billets with one end heated are delivered by roller conveyor, right. After forging and trimming they drop down a chute onto the chain conveyor, part of which appears at the lower right hand corner



Loading billets taken from the hopper at left into the magazine of one of two high-speed heaters at each side of the man who keeps the magazines stacked with billets



...AND FORGING

By HERBERT CHASE

8-hour shift, the chief problem is to deliver heated billets to the headers (of which two are used) at a sufficiently rapid rate to keep the headers operating at or near capacity. This is accomplished by providing two-high-speed slot-type billet heaters.

Each heater has a balanced type proportional mixer for gas and air that is fed into manifolds and issues from a set of opposed burners equally spaced along the heating zone. The slot has a cross shaped section. Impingement type burners are located the full length of the slots. These burners feed the burning mixture against both sides of the billets whose ends project through one lower slot to a point slightly beyond the center of the cross.

Products of combustion issue from the fourth opening of the slot and enter the flue. All burners are water cooled. Walls of the slot are refractory, the refractory being held in place by fabricated steel shapes. The heating zone is only 36 inches long; billets are fed longitudinally through the slot at such a rate that their upper ends are heated to forging temperature by the time they reach the end of the slot and fall onto the short inclined roller conveyor to the header.

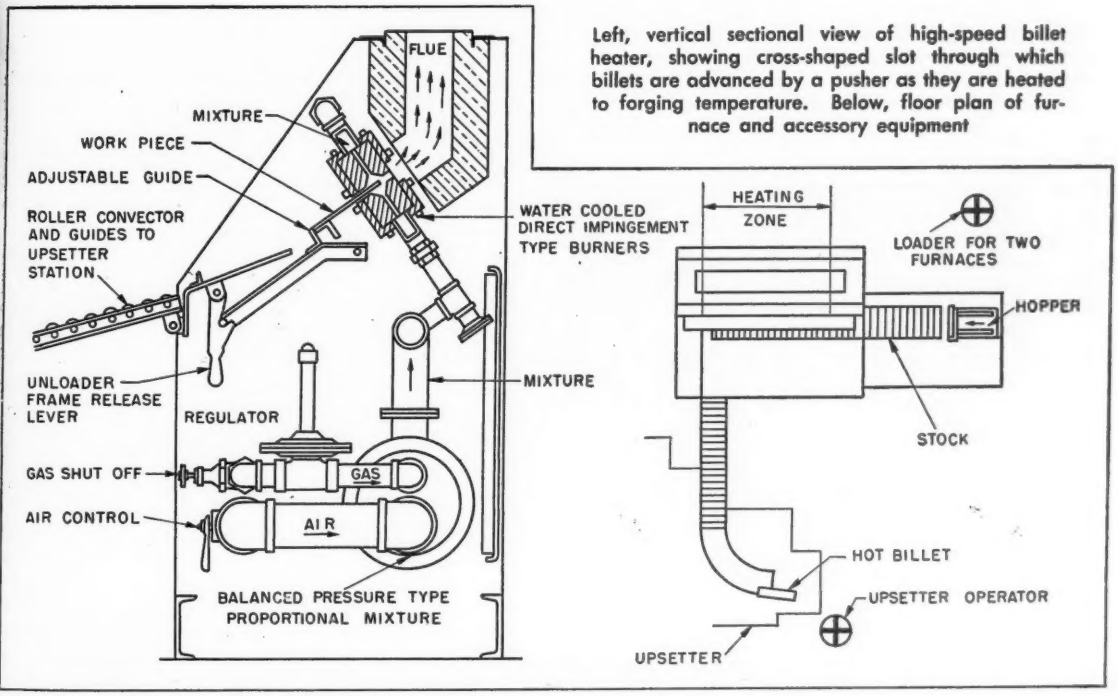
Automatic Delivery—Each heated billet strikes a deflector at the end of the roller conveyor and comes to rest with the hot end away from the header operator. It is then in convenient position for him to pick it up with tongs, head and trim it and drop it into a chute. The forging then slides onto a short elevating chain conveyor that deposits the forgings in a tote box. Flash trimmed off drops into another container. By the time the operator of the header completes one forging, another is automatically delivered to pick-up position.

To feed 500 billets an hour to each of two headers would be practically impossible without excessive labor if automatic feeding means were not provided. Each heater is therefore equipped with a magazine and a pusher timed to feed one billet at a time onto a track and to advance this billet, along with the row of billets ahead of it, through the heating slot.

One-Man Job—Motors and mechanism for driving the pusher are housed in cabinets back of the heaters and below the magazines, which are loaded by hand in vertical slots that fit the billets, stacked one above the other. With this arrangement, one man can take billets from the hopper and stack them by hand in the two magazines as rapidly as the billets are fed out.

At each forward stroke of each pusher, one billet is wiped from the bottom of the stack in the magazine and drops onto the track along which the billets are advanced through heater slots. At the lower side, the track includes two angles which extend along below the slot, one of them constituting an adjustable stop. They guide the lower end of the billets while they are being advanced.

If forging or other delays occur, the lower stop angle can be dropped by a release lever so that billets



Left, vertical sectional view of high-speed billet heater, showing cross-shaped slot through which billets are advanced by a pusher as they are heated to forging temperature. Below, floor plan of furnace and accessory equipment

already heated will fall onto a tray and not be overheated by remaining in the slot. While being advanced longitudinally through the slot, billets rest at 45-degree angle and their upper portion is guided by the slot itself. As each billet reaches the end of the heating zone, its lower end clears the stop angle and the billet slides down automatically onto the short roller conveyor that carries it to the operator of the header.

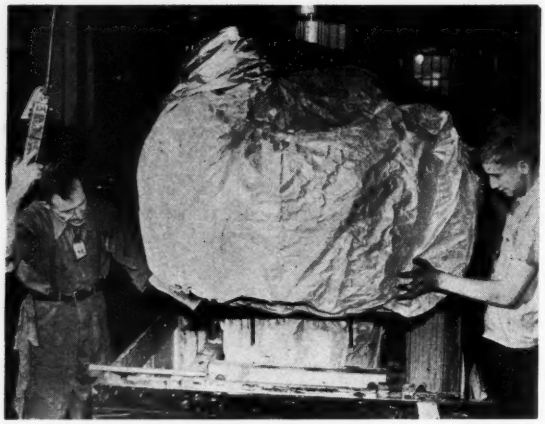
With this setup, using one man to keep both magazines loaded and one operator at each header, an average of 1000 forgings an hour is attained. This does not include, of course, labor for shearing billets or for transferring them to and from the heating and forging setup here described. Uniform and high speed heating is accomplished. Thanks in part to the rapid semiautomatic handling setup, the labor charge is low.

Barrier Materials Seal Out Corrosion

FLEXIBLE barrier materials for military packaging must be able to "take it" in low temperature service as well as in tropical and temperate climates. New materials meeting these specifications are available and cost less than the wrappings devised in the early 40s when the principal requirement was the use of the least critical materials cost was secondary.

One barrier material that meets military specifications for Method II preservation is Metalam made by Dobeckmun Co., Cleveland. It consists of aluminum foil laminated to vinyl plastic film and polyethylene film and then to scrim cloth. It is largely impervious and the metallic layer resists oils, greases and organics in general. It is also resistant to acids of some kinds. VPI, the vaporizable organic rust inhibitor, may be incorporated in the wrap or placed within it.

Method II preservation is primarily designed to afford protection in shipment and storage to parts and equipment when the nature and intended usage of the unit, the designation of the unit and the adaptability of this type of preservation to unit preclude other methods of packaging. Units adaptable to this method include: Engines, electrical and radio equipment, delicate instruments, propeller hubs, photographic equipment, guns and other equipment where failure to provide for proper depreservation would result in appreciable hazard to the unit and personnel involved in its use.



Metal pins or aircraft engines are given lasting protection with metal-laminated barrier materials. Heat sealing devices form envelops that conform to the part being protected

Corrosion Sealed Out—In actual operation barrier materials are used in a converted form such as envelopes, and are closed by heat sealing devices of several types. Usually these heat sealing mechanisms are of the jaw type or rotary disk and are heated by resistance elements. The heat sealing temperature is dependent on the pressure exerted by the functioning portion of the apparatus and also the length of time that this heat and pressure is maintained.

Generally the most commonly used combination of these requirements is 425 to 450° F at 20 psi for 1/3 to ½-second dwell as delivered by a jaw type sealer. Another variable is thickness or gage of material being sealed. In the main the optimum sealing conditions are those determined by the individual operators with the type of barrier material being used.

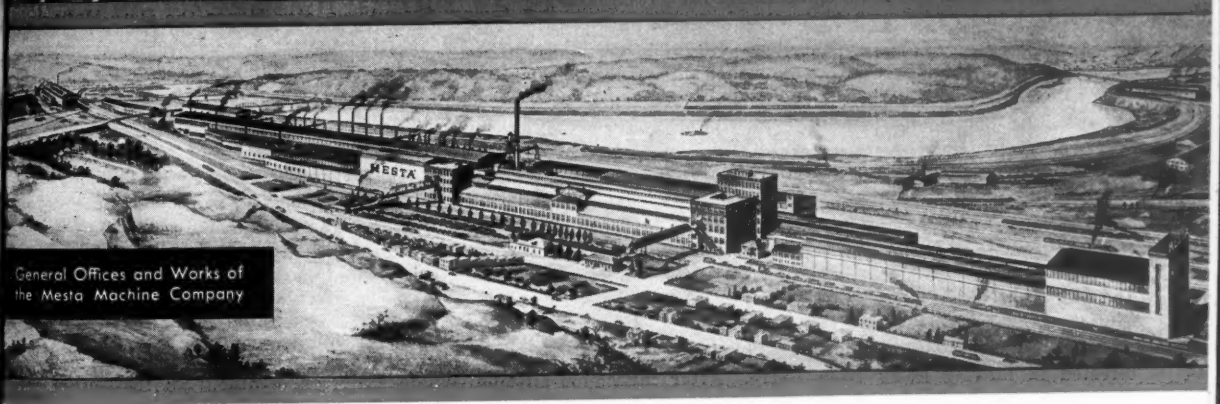
Where a large number of identical pieces are being packaged from a line, a foot-pedal-powered heat sealer is applicable and may lead to greater production. There is no fixed formula for the temperature and time of application, as the room temperature, material thickness and other factors may have constantly changing values.

Important Functions — All the materials used in making Metalam serve important functions in providing a better flexible package. The aluminum layer is a support for the sealing vinyl layer and a barrier between it and the polyethylene. It provides the resistance to oils, greases and organics in general plus some acid resistance. Any pinholes in the aluminum are filled by the resistant vinyl or polyethylene resins bonded to it. Aluminum has fair tensile strength but little resistance to tearing.

Depending on the size of the article being packed and the stresses to which the barrier sheet will be subjected, the thickness and strength of the cotton scrim layer is increased or reduced. Cotton is the cheapest and one of the strongest textiles. The woven cotton resists tearing and aids importantly in helping guard against pilfering since the wrap is tough and hard to open and reclose without detection.

Records Compressed By Microfilm

Personnel records required by the Defense Department for firms working on military contracts, can be handled by the Kard-a-Film method developed by Remington Rand Inc., New York. Vital statistics are put on microfilm and inserted on a special card. A normal file drawer holding from 3000-4000 sheets can hold up to 250,000 letter-size film records.



General Offices and Works of the Mesta Machine Company

Mesta equipment is produced from raw materials to finished product in this unit plant, the largest of its kind in the world.

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PITTSBURGH, PENNSYLVANIA

Seen and Heard in **The Machinery Field**

By GUY HUBBARD
Machine Tool Editor

HEALD'S 125th BIRTHDAY: America's machine tool industry definitely has come of age. Fiftieth birthdays now are common. Seventy-fifth anniversaries are not unusual. Centennials have been celebrated by at least three companies.

This week, however, Heald Machine Co. of Worcester, Mass., holds open house to commemorate a truly extraordinary combination of industrial and managerial longevity. "Born in 1826 and still going strong"—this organization has maintained an unbroken record of Heald family management for 125 years.

When Stephen Heald started the business in 1826, it was a small woodworking shop beside a mill dam in the central Massachusetts village of Barre. At that time, Eli Whitney—father of interchangeable manufacturing—had been dead less than a year. As yet there was no American machine tool industry.

Pioneering with a line of farm equipment including ox bows, corn cob crushers and cheese presses, Stephen Heald soon found it necessary to add a blacksmith shop, gray iron foundry and machine shop to his facilities. Like other industrialists of that era, he designed and built his own machine tools.

Stephen's son Leander S. Heald came into the business as a partner in 1864 and S. Heald & Son broadened their line to include "air-tight stoves," hay tedders and a patented horse rake which stacked as well as raked the hay. Their first venture into the industrial tool field was a sash trimmer.

When venerable Stephen Heald died in 1887 at the age of 86, James N. Heald—son of Leander and an 1884 graduate of Worcester Polytechnic Institute—became his father's partner. With the advent of James, the company became L. S. Heald & Son.

New Machine Tool Era Dawns

Convinced that grinding was destined to become one of the major machining methods, James N. Heald "eased the company into the grinding machine business" with a hand cranked attachment for truing hardened centers and for various other external and internal grinding operations in lathes. He followed this with a guided twist drill grinder which did away with "free-hand" methods then in vogue.

"And now," to quote from the 125th anniversary brochure prepared by historian Lew Hastings, veteran advertising manager of Heald, "we come to the year 1903. James Heald—then 38—realizing that the business was handicapped by its rural location, wanted to move it to the thriving city of Worcester, 21 miles away, where more adequate supplies of labor and materials, better transportation and additional capital would be available.

"Leander Heald—then 67 years old—was not interested in moving away from Barre. After much discussion, James finally obtained an option to buy his father's share of the business. With a wife and two boys, James had been unable to accumulate any financial resources out of his modest salary.

"He went to Worcester, put up at a small boarding house and—in the best tradition of an Horatio Alger hero—went out daily in search of capital necessary to bring the business to Worcester. Charles H. Morgan of Morgan Construction Co. was favorably impressed. His two sons, Paul and Ralph, decided to subscribe for stock, as did Oliver B. Wood, proprietor of Commonwealth Press, and John W. Harrington of Harrington & Richardson Arms Co.

"Literally on the last day of the option period—the only train to Barre having left—James Heald and Ralph Morgan drove by horse and buggy to Barre with the cash in a bag under the seat. They closed the deal with Leander Heald.

"On August 23, 1903, Heald Machine Co. was incorporated, with James N. Heald treasurer and general manager, Paul B. Morgan president, and John W. Harrington clerk. Operations soon were underway in a 90 by 100 foot rented building.

Things Move Fast in Worcester

Originally there were 17 employees in this Worcester shop, and its products were similar to those made at Barre—but not for long. Machine tools developed by J. N. quickly gained ascendancy. First came a 6-inch rotary surface grinder for the sides of automobile piston rings. Next J. N. tackled the problem of grinding bores of automobile cylinders.

Result was a successful planetary spindle machine of which hundreds were sold. Internal grinders of work-revolving type were introduced in 1908, hydraulic table traverse was applied to them in 1922, automatic sizing — Size-Matics and Gage-Matics — came later in the 1920's, and about 1930 appeared the internal centerless with magazine feed.

In the meantime J. N. had been experimenting with a "single point diamond boring machine." When cemented carbide tools became available in the late 1920's, this machine quickly was adopted to their use—not only for precision boring, but also on turning, facing, fly-cutting, etc. Hence the Bore-Matic.

Today, Heald Machine Co. occupies 350,000 square feet of floor space, employs 1500 people, and supplies grinding and boring machines—and highly specialized fixtures for these machines—to a world-wide market.

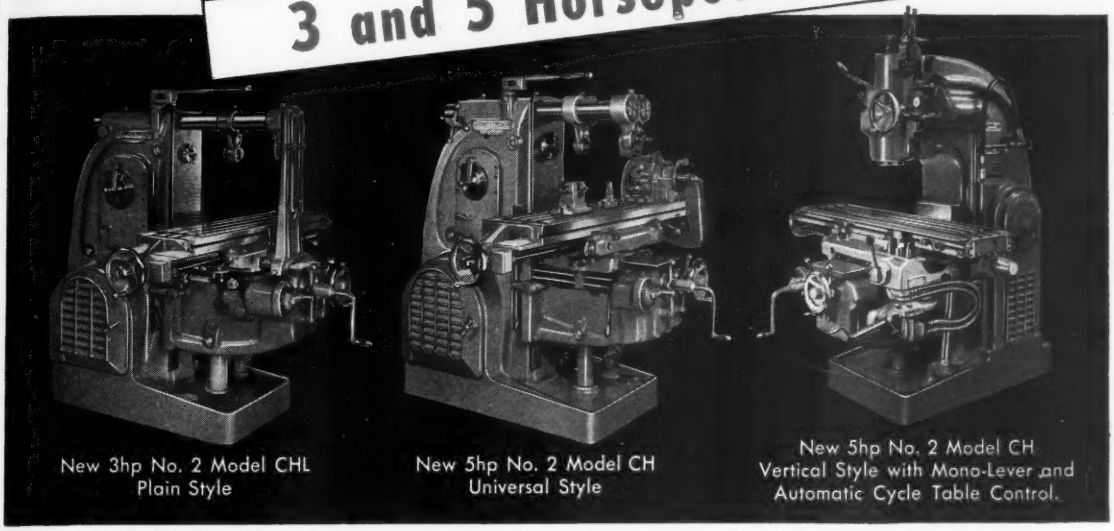
James N. Heald—whose rare combination of engineering ability, economic foresight and personal initiative transformed a small town "job shop" into one of America's outstanding machine tool companies—died in 1931 at the age of 66. By that time he had brought his four sons into the business. Roger now is chairman of the board, Richard is president and Robert vice president. The promising engineering career of Stanley was cut short by death at 28.

Ralph Waldo Emerson wrote: "An institution is the lengthened shadow of one man." With that in mind, this 125 year old Heald institution can well be symbolized by overlapping, ever-lengthening shadows of four generations of Healds. May their shadows never grow less!

Kearney & Trecker Announces . . .

THREE NEW KNEE-TYPE MACHINES

3 and 5 Horsepower



New 3hp No. 2 Model CHL Plain Style

New 5hp No. 2 Model CH Universal Style

New 5hp No. 2 Model CH Vertical Style with Mono-Lever and Automatic Cycle Table Control.

New Kearney & Trecker No. 1 CH, No. 2 CHL and No. 2 CH Milling Machines (Plain, Universal, and Vertical Styles) have every performance-proven operating and construction feature needed for modern short-run or production milling requirements

These specifications point up the new larger working ranges of these new machines. You'll find they provide you with new major cost-cutting possibilities for toolroom and production work. Feeds and speeds listed are standard ranges. Optional ranges available.

Machine	TABLE			Feeds Number & Range	Power Rapid Traverse — " Per Min.	SPINDLE	
	Working Surface	Power Feed Travel				Nat'l Std. Taper	Speeds — Number and Range
		Plain & Universal	Vertical				
No. 1 Model CH Plain, Universal and (swivel head) Vertical	40" x 10½"	Long. 22"	22"	16—½" to 32"	150"	40	16 — 25 to 1500 RPM
		Cross 8"	10"				
		Vert. 17"	16"	16—¼" to 16"	75"		
No. 2 Model CHL Plain, Universal and (swivel head) Vertical	46" x 10½"	Long. 28"	28"	16—½" to 32"	150"	40	16 — 25 to 1500 RPM
		Cross 10"	10"				
		Vert. 17"	16"	16—¼" to 16"	75"		
No. 2 Model CH Plain, Universal and (sliding head) Vertical	50" x 12"	Long. 28"	28"	16—¼" to 32"	150"—plain & vert. 100"—universal	50	16 — 25 to 1500 RPM
		Cross 10"	12"				
		Vert. 18"	13"*	16—⅛" to 16"	75"—plain & vert. 50"—universal		

*Add 4" vertical travel for sliding head

If you're looking forward to modernizing your toolroom or milling machine line—you can't afford to overlook these new 3 and 5hp knee types. They offer you more practical operating features and heavier construction than any comparable equipment. They're designed to answer today's milling needs — and tomorrow's as well. For complete data on these machines, contact your nearest Kearney & Trecker representative or write direct. Kearney & Trecker Corp., 6784 West National Avenue, Milwaukee 14, Wisconsin.

KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS

Radioactive Tracers Aid Blast Furnace Research

Time required for gas to travel from tuyere level to stockline and the rate of lining wear are determined by inert radioactive gas

By E. W. VOICE
British Iron & Steel Research Association
London

RADIOACTIVE tracers recently have been used in Great Britain to develop new techniques for measuring the time of gas transit through the blast furnace and the rate of refractory wear in the lining.

Measurement of Gas Transit Times—Radon is used, being the most easily available inert radioactive gas. Forty millicuries of radon at a time, contained in about 12 gold tubes each about ½-cm long and ¾-mm diameter, are injected through one tuyere of a blast furnace by an electric detonator and a ballistite charge which shatters the gold tubes and sweeps the gas into the furnace. (Fig. 1)

Through a flexible metallic tube above the stockline and vertically above the tuyere through which the radon is projected, samples of gas are withdrawn at 1-second intervals, (Fig. 2), and are subsequently analyzed for their radioactive content. Fig. 3 shows the results of an experiment on a stack with a 20-ft hearth operating on low-grade Northamptonshire ore in England. Although the word "speed" is used for convenience in interpreting these results, the actual path of the gas is obviously not known. It is essential that this should be borne in mind when estimates are expressed in feet per second.

It will be seen that the transit time of the gas is considerably less near the furnace wall than in the center of the furnace, taking just over 3 seconds to reach the maximum radioactivity at the wall against over 8 seconds at the center, equivalent to 22 and 8 fps, respectively. A series of five other experiments sufficiently confirmed this reading to warrant the following deductions, in addition to the gas transit time readings already noted:

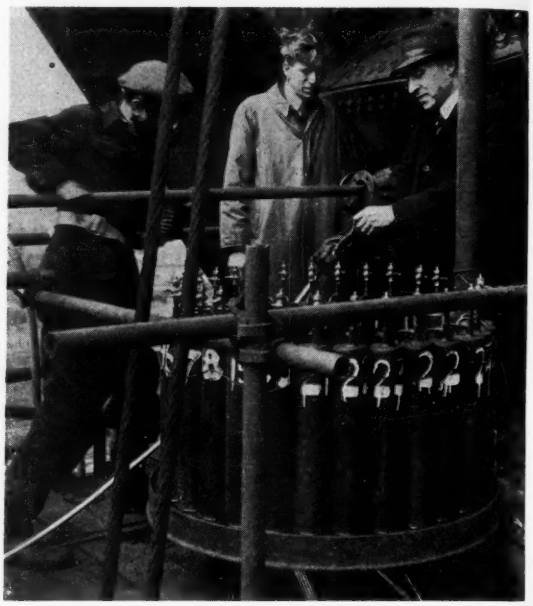
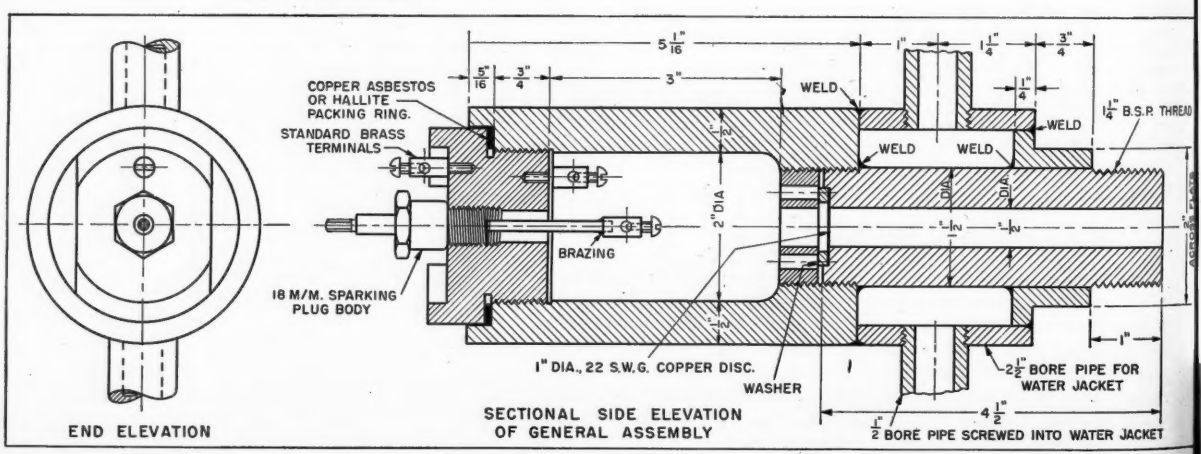


Fig. 2 (above)—Gas sampling at top of a blast furnace vertically above injecting tuyere

Fig. 1 (below)—Detonating apparatus for injecting radon into a tuyere



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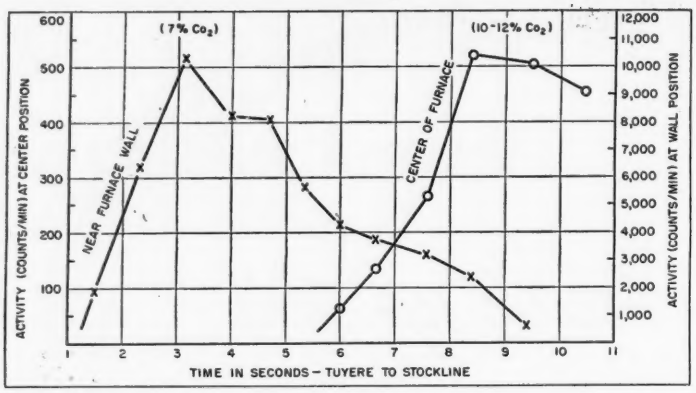


Fig. 3 (above)—Tuyere to stockline gas transit time readings on a 20-foot hearth blast furnace

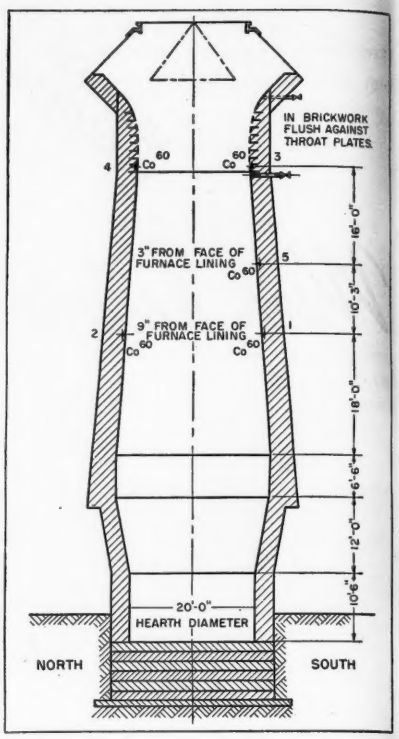


Fig. 4 (right)—Positions of Co^{60} pellets in lining of Stewarts & Lloyds Ltd. stack at Corby

1. Value of CO_2 in the gas is lower at the wall.
2. Gas temperatures are higher at the wall.
3. Rate of descent of burden is greater at the wall.

Other experiments have confirmed this general picture, which provides an interesting comparison with previous attempts to measure gas velocities. Kinney used a pitot tube to measure the dynamic head. Results obtained on a 19-foot 4-inch diameter furnace suggested that free area for flow of gas in burden was 8 per cent and gave gas velocities of between 70 and 450 fps in different positions. The pitot tube was 1½-inch diameter and was driven into burden through holes in the side of the furnace. Use of the pitot tube has the objections that it will measure pressure drops as well as dynamic heads, and that the presence of the pitot tube itself must affect the free area in the burden adjacent to the tip, which would in turn influence the reading from which the velocity is calculated. It is thought that the technique of using radioactive tracers avoids these disadvantages, and provides a useful means of exploring further the effects of burden porosities and the times of contact between the gases and solids, matters of obvious importance in connection with high top pressure and other developments in blast furnace operation.

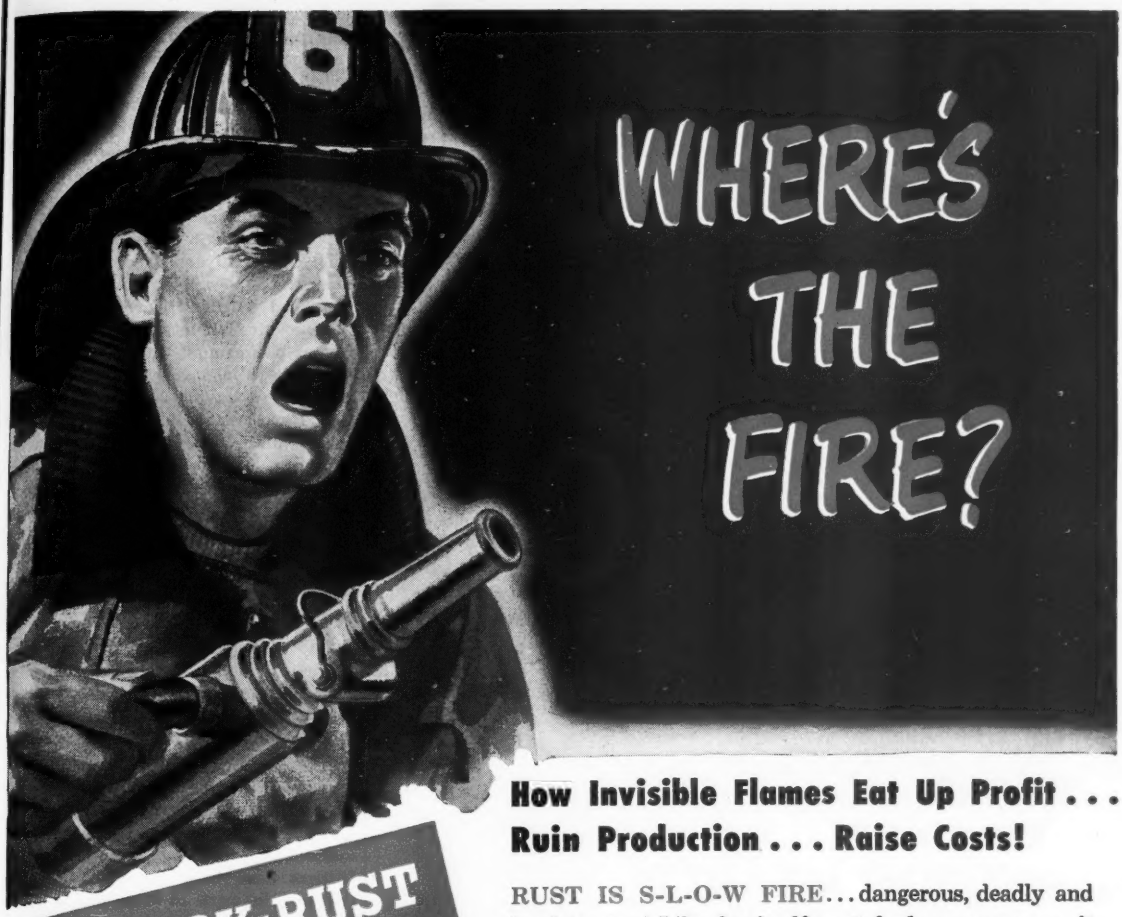
Measurement of Refractory Wear—Use of radioactive tracers for this purpose has reached beyond the exploratory stage, and though a good start has been made in five initial installations, definitive results are not likely to be available for some time.

Cobalt-60 is used, as a source of gamma rays as it lasts a long time, gives a strongly penetrative radiation and is quickly and cheaply produced from Co-59 in an atomic pile. In the stack, bosh or tuyere belt where the counter can be brought within about 2 or 3 feet of cobalt pellet, radioactive tracers have been built into the lining bricks of five furnaces, their activity being detected from outside the shell. One installation has also been made in the carbon hearth bricks of one of these furnaces, where the counter cannot be brought near enough. When wear on the hearth releases the pellet into the iron, all the iron will become active. If samples are kept at each cast, then by showing the samples to a counter, weeks later if necessary, it will be possible to say when the pellet entered the iron. It must be emphasized that the counters are extremely sensitive and the activity envisaged is only roughly equal to the effect of adding the luminous paint from one wristwatch to every hundredweight of iron.

Available details of the installations mentioned, are as follows:

The first pellets tried were in No. 4 furnace of Stewarts & Lloyds Ltd. at Corby. Reliable absorption coefficients were not then available so some pellets gave activities at the shell of only about double background. This made detection difficult. Five 10 mC (millicuries) pellets were protected by silica sheaths and installed in November 1949 in positions as shown in Fig. 4. After four months the positions behind the wearing plates (3 and 4) were undetectable. Due to the low intensity (they are over 3 feet from shell surface) it is not certain that the pellets plus wearing plates have disappeared, because, should brickwork have swollen say 6 inches taking the pellets further from the counter, then a similar result would have been obtained.

Pellets 1, 2 and 5, however, still show their presence although the intensity has dropped some 50 per cent. This could be due to chemical attack and removal of some cobalt (thought unlikely) or carbon deposition within the brickwork or the brickwork swelling, taking the pellets further away from the shell. When more information is available, it should



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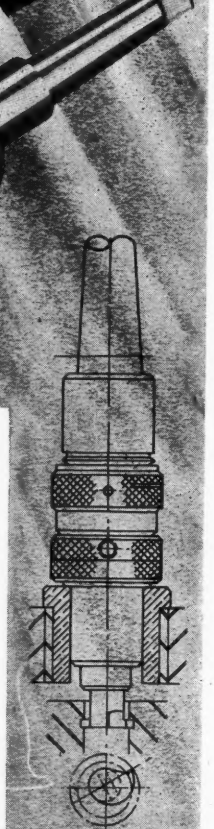
High-production Model J-F automatic recessing tools operate on any jig and fixture set-up. Interchangeable cutters and shanks make these Max-WELL-Made tools suitable for a wide range of operations.

Five standard sizes are available. Tools pilot into standard bushings ranging from 1 to 2¼ inches. Diameter of recess is governed by actuating stroke of tool which can be adjusted and set by means of stop collar. Distance from face of work to recess can be adjusted by stop thrust bearing.



For:

- ✓ snap ring grooves
- ✓ "O" ring grooves
- ✓ oil labyrinths
- ✓ inaccessible spot facing
- ✓ external necking
- ✓ precision undercutting

Model J-F recessing tools can be supplied with standard Morse, adjustable adapter, quick-change, straight or special shanks. Circular form high-speed steel or carbide tipped cutters can be used as required.

WRITE TODAY FOR (J-F) CATALOG AND DATA SHEET.

270-MC

THE MAXWELL COMPANY

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be possible to interpret the results—the main difficulty is due to the 10 mC pellets being up to 3 feet from shell. If a 2 foot limit is adopted for a 10 mC pellet, much more certain results should be obtained.

Two pellets were installed by the United Steel Companies Ltd. in No. 5 stack at Appleby-Frodingham—one 6 inches from the working face of lining and 47 feet 3 inches above centerline of the tuyeres, and the other 12 inches from working face of the lining and 47 feet above the tuyeres. These give counts about 8 to 10 times background, but as the furnace was blown in during April 1950, only a few results are available. Pellets were cast into open alumina crucibles and loose lids were wired on with platinum wire. It is therefore certain that if and when the stack lining wears away, the cobalt will enter the metal. There is, however, the doubt that the cobalt might evaporate or disappear chemically although it may be possible to detect this by a gradual loss of activity as measured at the walls. In fact, the pellets 6 inches from the inwall disappeared after 9 weeks and appeared in the metal. The pellet 1 foot from the inwall is still (one year later) in its original position.

Colvilles Ltd. have installed some 10 mC sealed alumina pellets in positions in the stack and positions adjacent to the slag notches. Two others have been fitted in the iron notch brickwork to show if and when the original brickwork is replaced by clay. Here distance from the pellet to counter is over 2 feet 6 inches but a probe type counter can be pushed down the drilled hole before tapping. Both iron notch pellets had gone within 9 months, while the stack pellets remained in their original location.

Sheepbridge Co. Ltd., have installed on a furnace, which is soon to be blown in, a 5 mC open alumina pellet at the junction between the carbon hearth and brick stack. This will be detectable at the shell, because the distance is not great. They will also use 2 mC in an open alumina crucible in a firebrick laid as part of the protective course on the top of a carbon hearth. A pellet of 2 mC was chosen as just enough to detect and not enough to be objectionable, bearing in mind two points:

1. It may enter the metal in the first tapping, which may be only 20 tons.
2. The metal is cast into pigs and may suffer little dilution before being cast by foundries.

Dorman, Long and Co. Ltd. have

included cobalt pellets near the hearth jacket of a furnace by drilling and inserting the pellet in the rammed carbon between the brickwork of the furnace and the hearth jacket itself.

REFERENCES

"A Radio-Active Technique for Determining Gas Transit Times in Driving Blast Furnace," by E. W. Voice, *Jl. of Iron and Steel Inst.*, November 1949, vol. 163, p. 312.

Discussion on above paper, *Jl. of Iron and Steel Institute.*, December 1950, vol. 166, p.315.

"Radio-Active Indicators for Blast Furnace Refractory Wear," by E. W. Voice, *Jl. of Iron and Steel Inst.*, February 1951, vol. 167, p.157.

"The Blast Furnace Stock Column," by S. P. Kinney, U. S. Bureau of Mines, 1929, Tech. paper 442.

New Generator For Alabama

A new turbine-generator is being built by Westinghouse Electric Corp. for installation early next year at the Gorgas, Ala., power station of the Alabama Power Co. Valued at nearly two million dollars, the 100,000-kilowatt turbine-generator unit will be about 72 feet long and weigh 900,000 pounds. Westinghouse engineers estimate that the unit will nearly consume its own weight in steam every hour in rotating the 70-ton rotor 3600 revolutions per minute. Tip speed of the last row of turbine blades will be 942 miles per hour—well above the speed of sound.

It will require about 90 minutes to bring the generator to its peak operating speed, and take 30 minutes for the unit to coast to a standstill.

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A complete, new 20-page illustrated book concerning vibrating screens for the fast, accurate dry-screening of light and fine materials, and other models for low-cost, high speed separation of solids from liquids, has been published by Link-Belt Co.

Both types of screens are available in a wide range of sizes. One model can be furnished with single or multiple decks, and with semienclosed or totally enclosed steel housings where required.

Descriptive material includes specific information on how to select the right screen and screen cloth for maximum operating efficiency; dimension tables, weights, horsepower requirements; and other data of value to the engineer.

Shown are a variety of actual installations which include sizing, scalping, removing foreign matter, reclaiming oil well drilling mud, and removing solids from factory waste water to recover usable materials and/or avoid pollution of streams and waterways.

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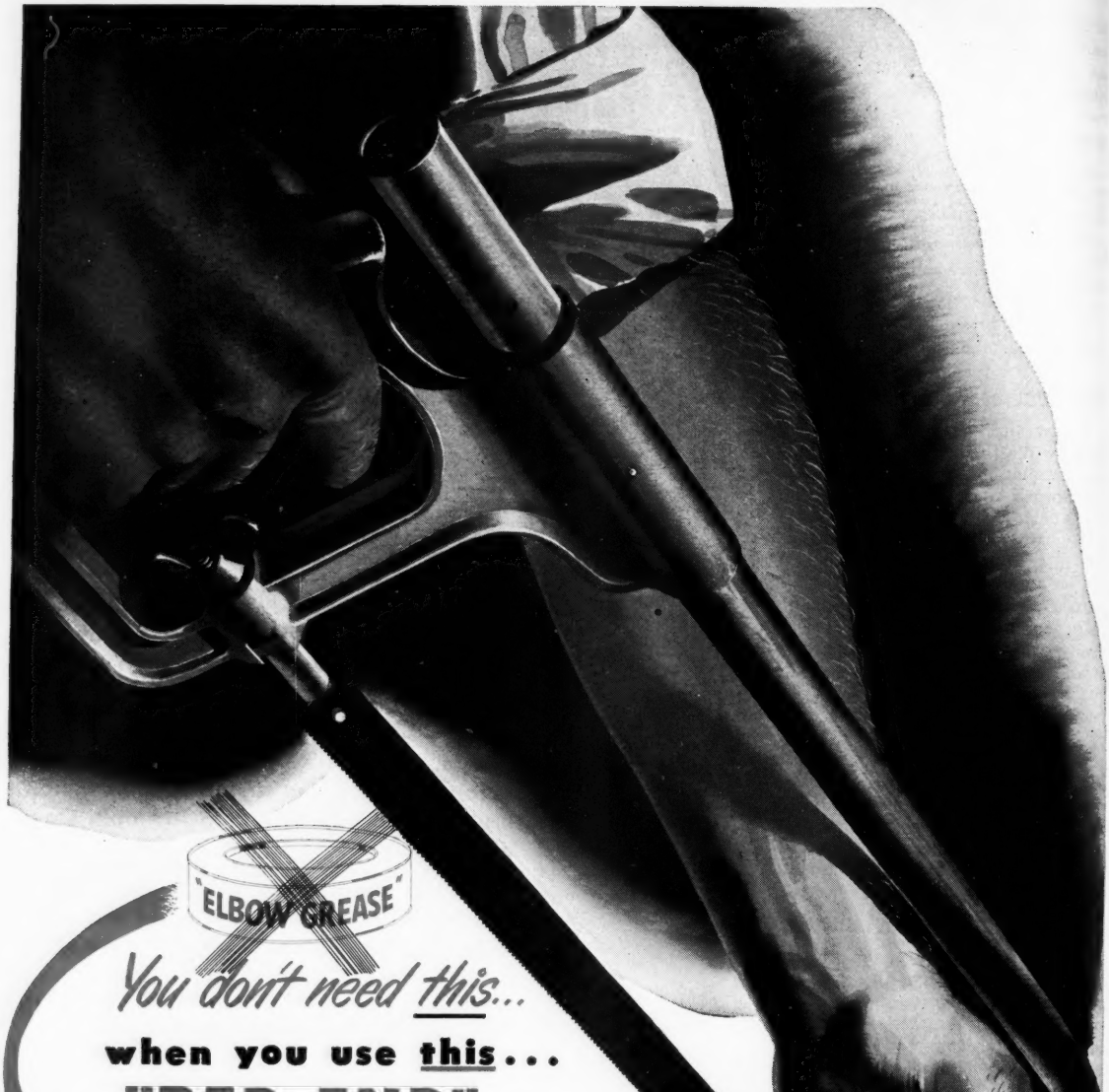

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Better Plating Methods Discussed by AES

WAYS of improving electroplating techniques and controlling quality were thoroughly discussed at the American Electroplaters' Society convention in Buffalo, July 30 to August 2. Following are abstracts of some of the papers presented.

Organic Coatings in Today's Metal Finishing, by Donald R. Meserve, United Chromium Inc., Carteret, N. J.

Clear lacquers or synthetics are often used in normal times to supplement metallic finishes, but when shortage of metals for plating occur, these organic coatings can be used in other ways to make bright metal finishes possible in spite of governmental restrictions on the use of critical metals such as copper, nickel and brass.

Bright chromium plate without an undercoating of nickel would not be a practical finish for most conditions of exposure were it not for the fact that special clear baking synthetics having the necessary hardness, clarity, gloss, adhesion, abrasion resistance, and resistance to humidity and salt atmosphere have been developed to protect and supplement the chromium.

Long experience in the formulation of clear coatings for normal use in the hardware, sporting goods and other industries has provided a sound background from which technologists have been able to progress rapidly in the development of organic coatings that have the desirable properties for new uses.

Acrylic alkyd - ureaformaldehyde, and melamine - formaldehyde - alkyd resin combinations have been found to be the most suitable for metal-finishing purposes. Most specifications written for these materials are more stringent than those for the usual copper-nickel-chromium finishes. Dry - film thicknesses range from 0.0005 to 0.002-inch, and the films are baked for 20-30 minutes at 250°F or as little as 7-10 minutes at 400°F. Excellent adhesion is possible when proper surface preparation is employed.

A chromium - like appearance can be attained with bright zinc which has been clear-dipped and protected with clear synthetics. Extensive use of this finish in the refrigeration industry has not only proved its value, but has also provided extensive experience in the detection and rem-

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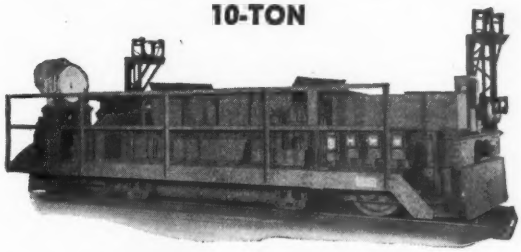

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Single Hopper Type, equipped with Atlas All-Steel Roller Suspension Scale provided with Atlas Indicating and Type Printing Recorder. Car has air brakes, air operated discharge gates. Bus-type control with usual interlocks and standard safety equipment.

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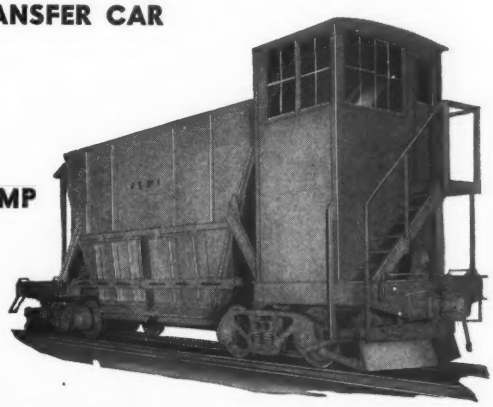

Two compartment hopper with separate discharge gates, independently operated from front and rear vision cab. Car is equipped with air brakes, self-aligning bearings and standard safety equipment.

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edy of troubles which may be encountered.

Tinted clear coatings may be used to simulate gold, copper and brass, and can be applied to chromium, zinc, stainless steel and aluminum. Opaque, pigmented coatings are, on the whole, unsatisfactory as substitutes for metallic deposits, and consumer resistance to them is high.

Mechanical Finishing of Zinc Base Diecastings Prior to Plating, by M. R. Caldwell, assistant vice president, Doehler-Jarvis Corp., Grand Rapids, Mich.

A properly designed die with a well polished and chromium plated cavity should produce diecastings with a surface that would need no buffing prior to plating. However, even in the absence of surface defects as the casting is removed from the die the parting lines must be trimmed off and polished, and these operations generally cause nicks and scratches that necessitate buffing of the entire bright area.

The dense "skin" on the casting should be preserved during buffing in order that the number of corrosion spots in use be kept at a minimum. Only very shallow pores in the surface can be bridged during copper-nickel plating; others can be removed by polishing or hard buffing for maximum corrosion resistance. However, air pockets in shallow pores will expand during baking of the plated castings and raise blisters.

Machine finishing is a necessity to reduce cost and meet production requirements in the author's plant with its large production—in 1950, 280,000 castings daily, weighing 0.43 pounds on the average and 15.5 pounds maximum.

Size and contour, required final finish, presence of holes and threads, possibility of distortion and adaptability to automatic machine polishing are factors which are taken into account in the choice of finishing method.

Many small parts are barrel burnished, sometimes after a strapping (belt polishing) of the parting line, in two-compartment, 32-inch diameter, 60-inch long barrels, run at 30 rpm at first and then 6—10 rpm for final coloring.

Parting lines are usually strapped, by hand or automatically, before buffing. Abrasive belts are preferred to setup wheels because of elimination of skilled labor and savings in material and labor. Polished areas and coarseness of polishing grain are continually kept at the minimum required by the condition of the part, and use of grease stick at a maximum, to reduce cost of subsequent

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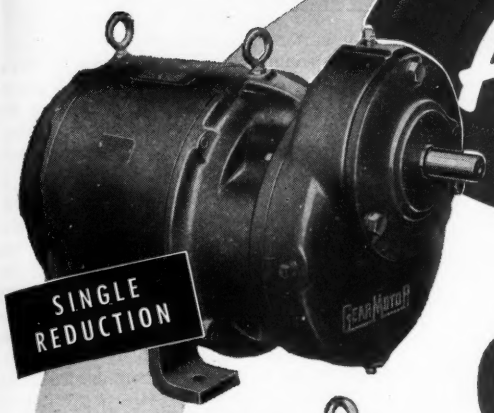

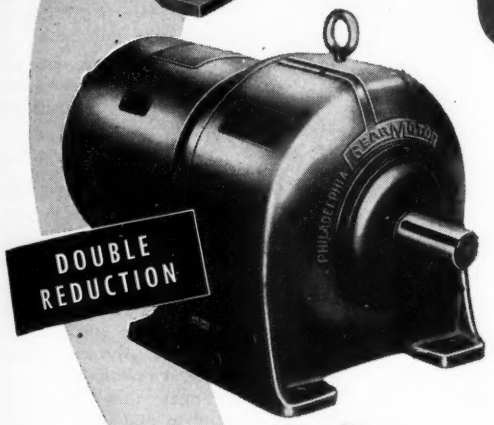

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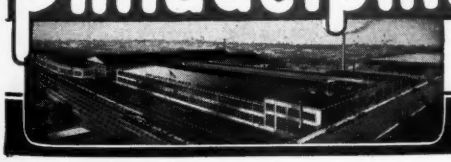

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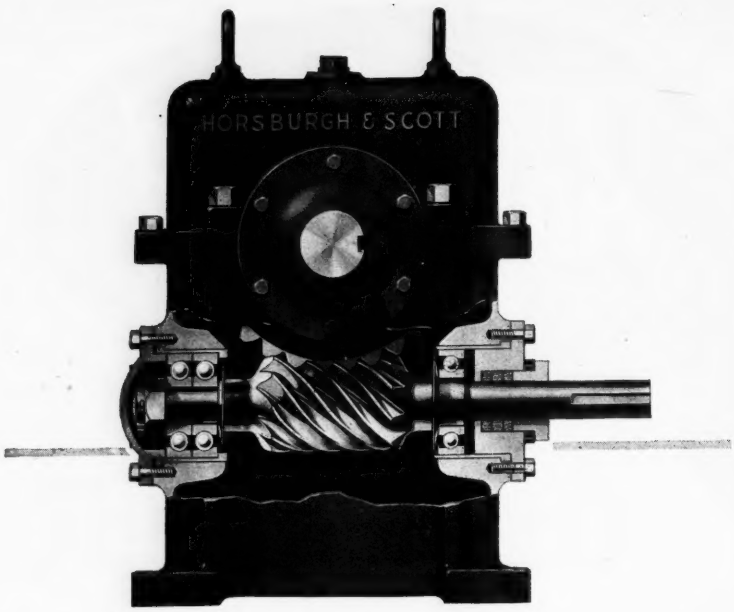

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buffing. Type of buff and buff speed are carefully selected for the same reason.

Liquid tripoli buffing compounds are rapidly gaining favor, even in hand buffing, and are carefully selected for minimum consumption, buff wear, and ease of removal by cleaning. Applications can be made automatic. The recirculating pump-type system is preferred over the pressure-can system because it eliminates transfer of compound and keeps it uniform.

A wide variety of automatic buffing machines are used: Semiautomatic, reversing type with only one fixture (two to a part), straight-line and return-type full-automatic with fixture guides and tilting mechanisms. Areas not reached on the machine are touched up by hand, sometimes with a portable high - speed head when the fixture is turning an end of a return-type automatic.

Optimum wheel pressure, once set, is controlled by an ammeter on the motor, which automatically considers the wheel speed.

Nickel Plating with Insoluble Electrodes, by W. A. Wesley, D. S. Carr and E. J. Roehl, research laboratory, International Nickel Co., Bayonne, N. J.

Although a nickel plating process which involves insoluble anodes would not be attractive to the decorative-plating industry, it offers distinct advantages in such other fields as plating steel strip and wire, electroforming screens, plating rolls, and plating the inside of tubes. Principle difficulty with the process in the past has been in devising means for replenishing the nickel content of the bath cheaply and with good control.

Replenishment can be accomplished on a continuous basis for a chloride-free nickel plating bath by means of a process which involves circulation of the electrolyte through a plating tank, a regeneration tank, and a filter. Nickel is dissolved in the regeneration tank at a controlled rate with the aid of periodic reversal of the current, and the pH of the solution increases. In the plating tank the nickel content of the electrolyte is depleted, and the pH decreases. If the electrode area in the regeneration tank is adequate, the composition and pH of the electrolyte can be controlled simply by adjusting the current in this tank.

Under these conditions, the cathode current efficiency in the plating tank was 68 per cent, and the power consumption for disolving nickel in the regeneration tank was 0.78 kw-hr

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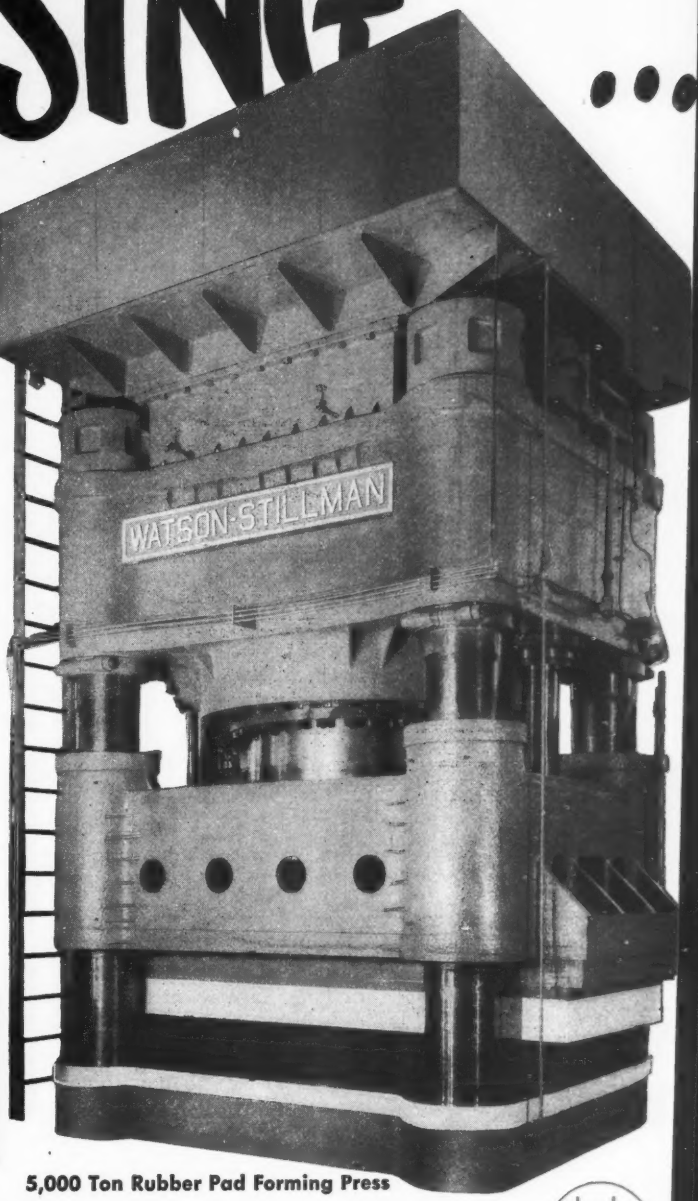

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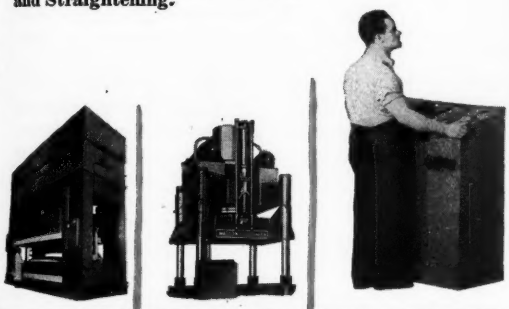
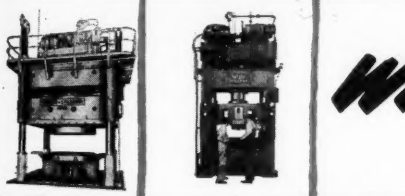
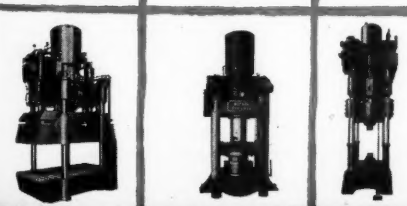
W-S Medium and Deep Draw Presses do things faster. Rejects are virtually eliminated . . . present dies and materials can be used . . . one or more draws may be cut from a progressive operation, thereby saving man hours on the job . . . intermediate annealing is often reduced or eliminated and total production time cut down.

Designed for precision work and built for long service, these W-S Hydraulic Presses offer further advantages in set-up, maintenance and tool life. Available in a large choice of pumping units and controls. It will pay you to investigate their flexibility.

Other W-S Metal Working Presses include those for Forming, Flanging, Trimming, Forging, Coining, Hobbing, Extruding, Briquetting, Bending and Straightening.







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per pound. Power costs for the regeneration cell are small, because it can be operated with close electrode spacing, a low current density and a series - parallel electrode arrangement.

Nickel deposits from the chloride-free bath have approximately the same mechanical properties as those obtained from a Watts bath. The hardness and tensile strength are a little higher, and the ductility somewhat less.

The process does involve a problem in ventilation, in that copious quantities of gases are liberated at electrodes and give rise to considerable spray.

Chromate Treatments, by Charles W. Ostrander, Allied Research Products Inc., Baltimore.

Chromate treatments are employed to prevent the formation of voluminous white corrosion products on zinc and cadmium surfaces, and to polish or color these metals.

Chromate conversion coatings on zinc, cadmium and in some cases aluminum surfaces are produced in three basic types of chromate solutions operated at pH's below 7. Within each type there are variations in procedure or conditions of operation which will lead to films having specific colors, corrosion resistance, or other properties.

The simple dip solutions for chemical polishing are operated at pH values of 0.0-1.5, and in 5-60 seconds yield lustrous coatings of medium corrosion resistance on zinc and cadmium which range in color from clear to light iridescent yellow.

Single - dip nonpolishing solutions operated at pH 1.0-3.5 will produce in from 5 seconds to 5 minutes medium-to-heavy films ranging in color from iridescent yellow to bronze, olive-drab and black Such films provide maximum corrosion protection, and, with the exception of black films, can be dyed red, green, blue or black with certain alizarine and diazo dyes. This general type of solution and procedure is applicable to aluminum and its alloys as well as to zinc and cadmium.

Solutions which require anodic treatment of the work will produce yellow-to-black films on zinc at current densities of 5-50 asf at pH values of 2.5-6.0 in 3-5 minutes. They find use in the aircraft industry for the production of black films and in refrigeration for clear films.

A New Degreasing Evaluation Test: The Atomizer Test, by H. B.

Here are facts that "talk turkey" to the alert businessman who must heat more metal products ***faster, cheaper, more efficiently.*** Take the production headache of the Whitney Chain Company, Hartford, Connecticut . . . now that was a tough one!

For years, Whitney used a lead-pot setup to anneal the ends of sprocket chain pins — hand dipping them ***one end at a time.*** Smashing this production bottleneck called for a reliable source of fast, efficient, selective heat. And they got just that with three Westinghouse 20 KW 450 KC RF units, each supplied with indexing ferris-wheel type work-handling equipment. Result . . . ***working only part-time, one operator can turn out 10 times the old production rate!*** What's more, RF Heating improved product quality, cut cost of production and material handling. All this with trouble-free operation.

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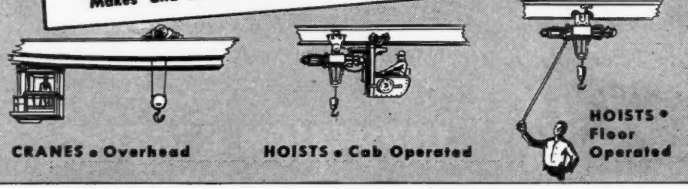
Makes and sells all three lifting tools for airborne shop loads



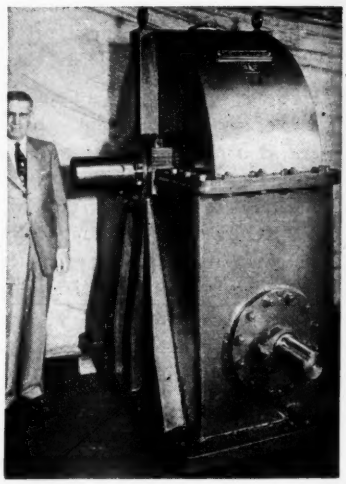
358 SCHUYLER AVENUE • MONTOUR FALLS, N. Y.

Linford and E. B. Saubestre, Columbia University, New York

A special specimen for the evaluation of tests for degreasing processes which exhibits uniform drainage has been designed and tested. It comprises a rectangular area of sheet metal with a tongue having an "S" bend at the top and a triangular extension at the bottom. Experience has shown that reproducible soiling and cleaning procedures can be carried out with it.

In the course of a study of tests which have been suggested for the evaluation of degreasing processes, a new procedure appeared to be far more sensitive than previous tests. The specimen to be evaluated is allowed to dry and is then sprayed for 30-45 seconds with a dilute aqueous solution of a dye from an atomizer at a distance of 2 feet with a pressure of about 18 inches of mercury. After being dried with a heat lamp the specimen will exhibit a dye pattern which reveals the areas that were not free of oil or grease. Permanent records can be easily made by tracing the dyed areas with a pantograph. It is suggested that the superiority of the atomizer test over the water-break test is due to its dependence upon an advancing

Worm Gear Is De Laval's Biggest

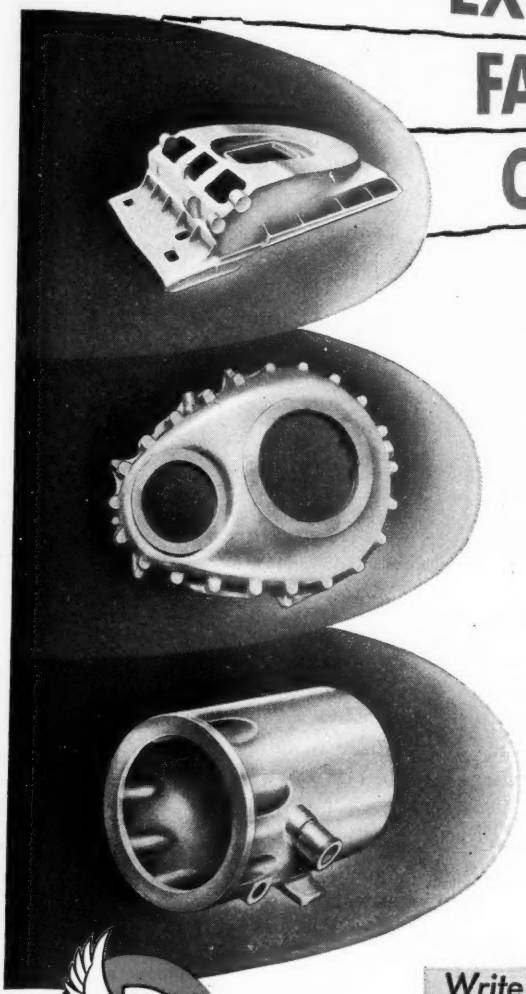


LARGEST standard enclosed worm gear ever built in the shops of De Laval Steam Turbine Co., Trenton, N. J., will soon go into service on a Mesta slabbing mill installation for a major steel company. It's a 30-inch center distance unit transmitting 200-hp at 410 rpm with a ratio of 17-2/3 to 1. A second unit of the same size is currently being built for installation in another mill

FOR YOUR DEFENSE JOBS . . .

your Aluminum Castings supplier must have

EXPERIENCE
FACILITIES
CAPACITY



These three essentials to reliable service protect you when you select Aluminum Industries, Inc., as your supplier of aluminum castings.

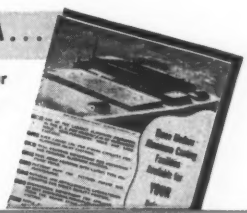
EXPERIENCE — Over 30 years of experience in working with aluminum and its alloys are behind the skill and "know how" of our metallurgists, engineers and foundry personnel.

FACILITIES — In each and every department, from the physical and metallurgical laboratories clear through to the finishing department, the most modern equipment is employed for precision processing, and to control quality at every step of production.

CAPACITY — You'll avoid delivery worries, too. With one of the largest aluminum foundries in the United States for the production of Permanent Mold, Semi-Permanent Mold and Sand Castings (monthly capacity over 2,500,000 lbs. of castings), you can depend upon Aluminum Industries to deliver your aluminum castings when you need them.

Write for Bulletin 20-A...

This new Bulletin illustrates and describes our complete facilities for serving your aluminum castings requirements. Recommendations and estimates given without obligation.



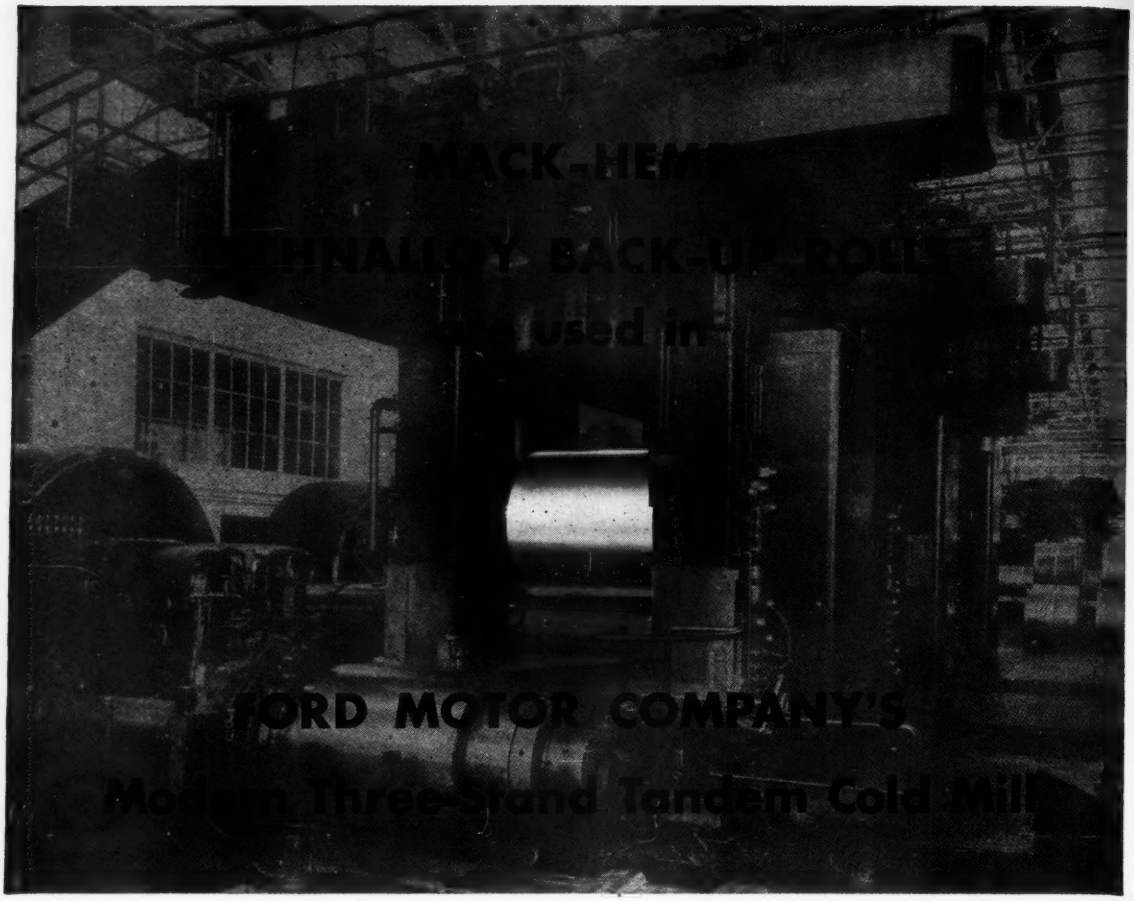
PERMITE

ALUMINUM INDUSTRIES, INC.

CINCINNATI 25, OHIO

DETROIT: 809 New Center Building. NEW YORK: 9 Rockefeller Plaza. CHICAGO: 44 E. Jackson Boulevard. ATLANTA: 413 Grant Building.

ALUMINUM PERMANENT MOLD, SAND and DIE CASTINGS...HARDENED, GROUND and FORGED STEEL PARTS



The efficient, modern cold mills at River Rouge Plant are equipped to supply the rigid specification steels for Ford Motor Company products.

In this 3-stand mill, the rolls *with the striped red wabblers*—49" x 66" Technalloy Rolls—are used for back-up in strip mill productioneering. In other steel-making operations at Ford Motor Company, rolls *with the striped red wabblers* are used for rolling hot strip and in blooming mills.

And it's the same story, day after day, wherever Mack-Hemp Rolls are used—the rolls *with the striped red wabblers* set the productioneering pace.

MACKINTOSH-HEMPHILL

COMPANY

Makers of the Rolls with the Striped Red Wabblers

PITTSBURGH and MIDLAND, PA.

MACKINTOSH-HEMPHILL PRODUCTS INCLUDE: ROLLS . . . STEEL AND SPECIAL ALLOY CASTINGS . . . COMPLETELY INTEGRATED STRIP MILLS . . . HEAVY DUTY ENGINE LATHES . . . MACKINTOSH-HEMPHILL ROTARY STRAIGHTENERS . . . IMPROVED JOHNSTON PATENTED CORRUGATED CINDER POTS AND SLAG-HANDLING EQUIPMENT . . . SHAPE STRAIGHTENERS . . . END-THRUST BEARINGS . . . SHEARS . . . LEVELLERS

contact angle instead of a receding contact angle.

The atomizer test was compared with the fluorescent-dye, spray-pattern ferricyanide and copper-dip tests for the evaluation of the residual oil on partially cleaned specimens which had been soiled with lard oil or mineral oil. When considerable residual oil remains on the specimen, the atomizer and fluorescent - dye tests have about the same equivalent sensitivity and are 20 times more sensitive than the other available tests.

The atomizer test improves as the amount of residual oil is decreased and for small amounts may become 20 times as sensitive as the fluorescent-dye test and 600 times as good as the ferricyanide test. Radioactive-tracer techniques may be this sensitive, but they are both expensive and technically difficult, whereas the atomizer test is so simple and cheap that it may be used in even the smallest plating shops.

Requirements of Zinc - Base Diecastings for Electroplating, by Glenwood J. Beckwith, vice president and general manager, Metallon Products Inc., Los Angeles.

Zinc - base diecastings suitable for electroplating can be produced only when due care is exercised with regard to the design of the article, design of dies, casting technique in the foundry, and composition of the zinc alloy.

Design of the article should be such that polishing can be easily accomplished without expensive special equipment or excessive hand labor. The designer should also keep in mind the requirements of the plater with respect to ease of racking for good contact, proper drainage and satisfactory throwing of metal to all parts of the article.

A die which is not properly designed will be the source of castings that contain coarse-grained areas, cold shuts, rough surfaces, and other defects which cause the plater a great deal of trouble and may lead to a ruinous number of rejects. Even trimming dies which are not properly aligned or are otherwise faulty will produce castings that are hard to polish, and the excessive polishing may cause plating troubles.

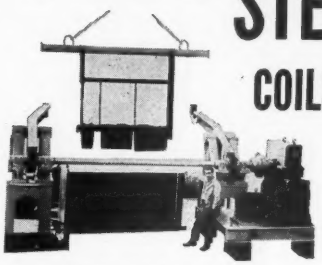
Foundry technique which does not recognize the effects of metal and die temperatures, lubricants, poor skimming, and the use of excessive amounts of scrap in the pot will inevitably lead to poor castings that will be difficult to plate properly.

NEW

THE ONLY PLANT IN EASTERN U. S.

EQUIPPED FOR STEEL PICKLING

COILS UP TO 48" WIDE



PICKLING coils:
1" to 48", 10 to 20 gauge
100 to 10,000 lbs.

SHEETS & PLATE: Any width, any length, any thickness.

CAPACITY: 25,000 tons/month.

Prompt Quality Service

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- EDGE ROLLING
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Subsidiary: AMERICAN TOOL & SUPPLY CO.

OFFICE: 822 FRICK BUILDING, PITTSBURGH 22, PA. PLANT: McKEES ROCKS, PA.

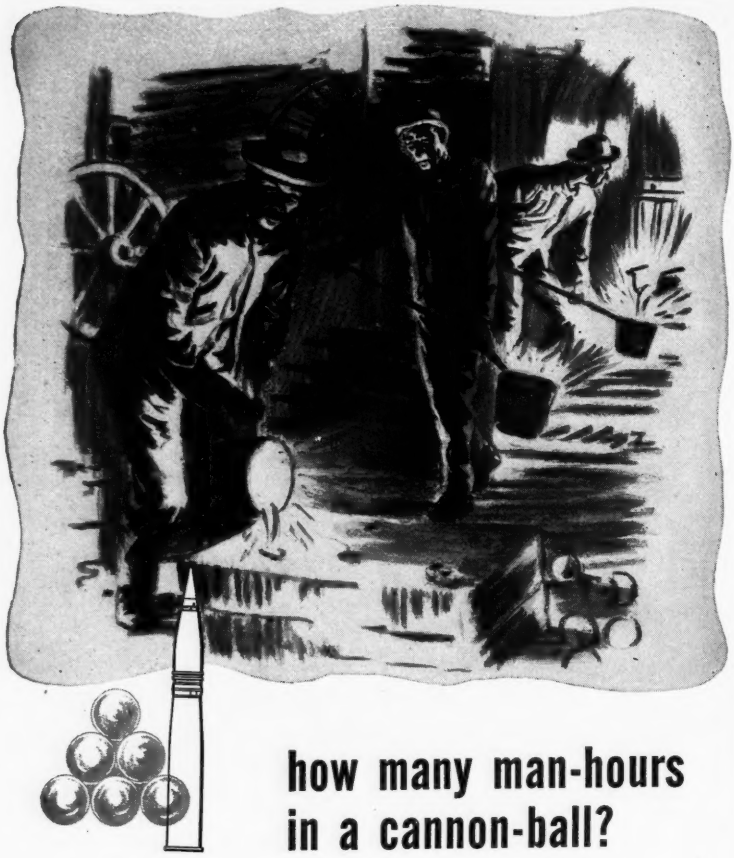
In the Yard or in the Plant...

EUCLID'S "pace" the Assembly Line

Euclid Cranes prove an important link in the chain of operations required to convert incoming materials into outgoing products in a vast number of manufacturing plants. Facility of movement through ease of precision control enables "Euclids" to handle a large variety of production operations, and to readily "pace" the assembly line. Write us concerning your crane problems. We'll be pleased to submit a proposal.

EUCLID CRANES AND HOISTS
Raise Profits

THE EUCLID CRANE & HOIST CO. 1364 CHARDON ROAD EUCLID, OHIO



how many man-hours in a cannon-ball?

Many a courthouse lawn still displays those iron balls, once supreme as heavy ammunition. Carefully molded and cast, they took a lot of human labor. Today's war machine uses precision projectiles that explode for maximum effect. These modern cannon-balls are mass produced utilizing press methods, so man-hour requirements are gratifyingly low.

If you make things of metal in large quantities, here's another object lesson. Whether your product is for defense or for civilian needs, Clearing engineers can show you the advantages and economies of press methods of manufacture. Get in touch with us.

CLEARING MACHINE CORPORATION
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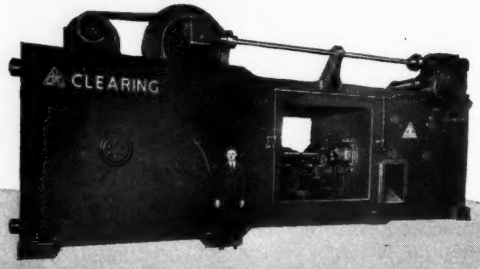
This Clearing press forged projectiles for World War II.



CMC CLEARING

CLEARING PRESSES

THE WAY TO EFFICIENT MASS PRODUCTION

Even the type of furnace is important.

Some of the impurities which may find their way into diecasting alloys can be the source of important plating troubles. Lead and cadmium are particularly troublesome, and even small amounts will cause blistering after plating. Many other impurities such as tin, promote subsurface corrosion, and cause effects which may be blamed upon the plater.

Advantages of Simplicity in the Electroplating of Automobile Bumpers, by Donald H. Schantz, assistant vice president, Michigan Bumper Corp., Grand Rapids, Mich.

When preparations were made to resume production of automobile bumpers after World War II, the prewar plating sequence was investigated to determine if a simplification would lead to improvements in quality and costs. A promising and important possible simplification was the elimination of the copper flash, which would not only reduce the number of steps in the sequence but also reduce waste disposal problems.

In the new sequence, cleaning is done in two steps, The first is an anodic cleaner, and the second makes use of alternating current to demagnetize the bumpers and prevent the accumulation on their ends of iron particles which lead to roughness in the nickel deposits All rinsing is done in spray-rinse tanks.

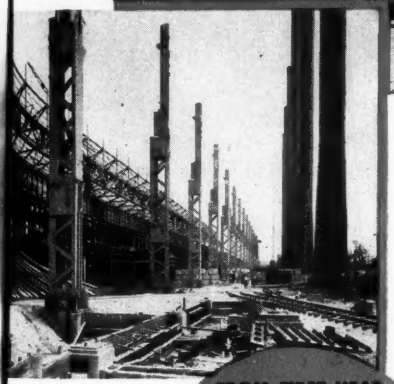
Key to successful adhesion of the nickel directly to the steel lies in the use of an anodic treatment in a solution of 65-70 per cent by volume of 66° Bé sulphuric acid at 60 asf and 80-100°F for 1.5 minutes, followed by a rinse prior to nickel plating. This treatment is responsible for a small amount of smoothing of the steel surface.

Substitution of a proprietary semibright nickel solution for a low pH Watts bath and other changes in the nickel plating operation permitted an increase in current density and a decrease in buffing costs.

Cathodic cleaners are used in preparation for chromium plating, and oxidation of the nickel is thereby kept at a minimum. The work is treated for a few seconds at low voltage in the chromium-plating tank under conditions which do not deposit any metal before the working voltage is applied. This helps to secure a bright chromium deposit. Occasional rejects owing to cloudy chromium are stripped of chromium and replated.

The product is believed to be equal

Eleven 250 Ton Open Hearths for J&L by LOFTUS



These six Open Hearths shown above are nearing completion and are scheduled to go into production this year. The other five will be completed early in 1952.

Open Hearth crews in leading steel plants throughout the country are establishing shop records with Loftus Open Hearths.

We have records in our files showing Loftus designed and constructed Open Hearths are giving

LOWER FUEL CONSUMPTION
MORE TONS PER HOUR
MORE TONS PER MONTH

That's why we say "Loftus Builds 'Em Better".

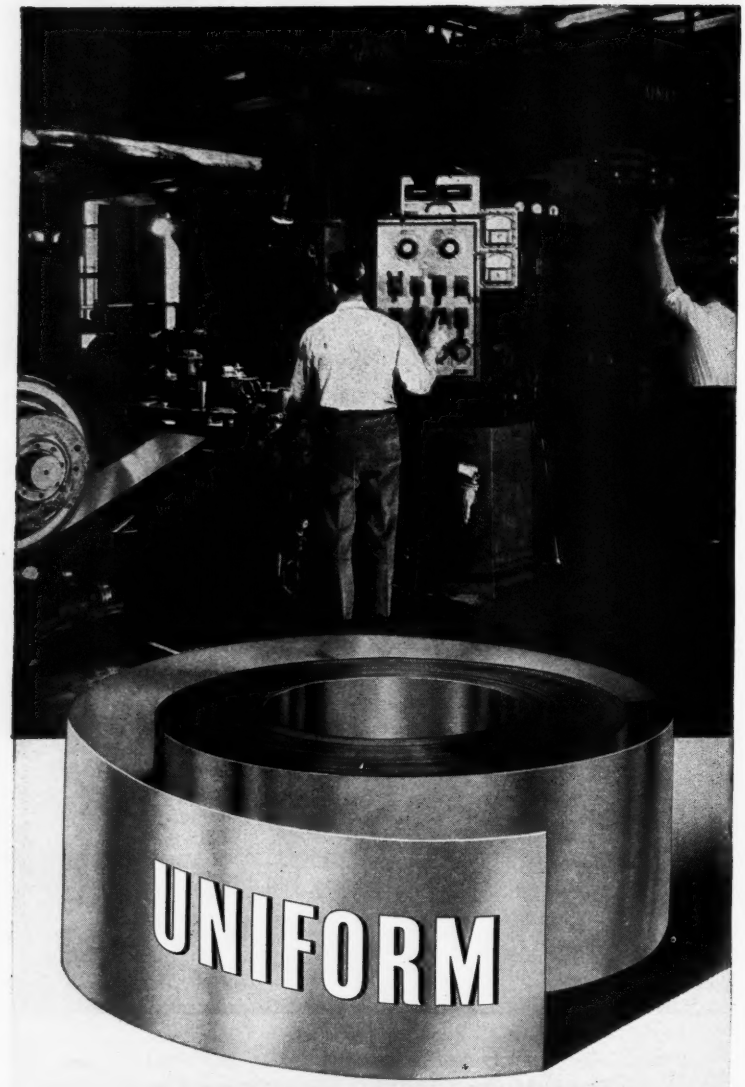
Turn Your Scrap In, Help Turn More Steel OUT!

FROM FIRST HEAT TO HEAT TREAT, LOFTUS BUILDS 'EM BETTER

LOFTUS ENGINEERING *corporation*

610 SMITHFIELD ST PITTSBURGH, PA.

Designers and Builders of INDUSTRIAL FURNACES



In this modern plant experienced workers, operating modern equipment with the newest and most efficient quality control devices, produce Wallingford strip steel and tubing of consistently uniform quality. In analysis, gage, temper, surface finish and every other respect Wallingford Steel meets specifications exactly. Whenever you reorder, in a week, a month or a year, the same uniformly high quality will be delivered. As a result your operations never need vary, the quality of your product will be as uniform as that of Wallingford Steel.

THE WALLINGFORD STEEL CO.

SINCE 1922

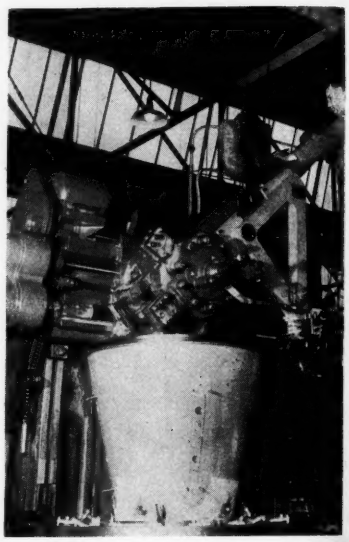
WALLINGFORD, CONNECTICUT, U.S.A.
LOW CARBON • HIGH CARBON
ALLOY • STAINLESS • STRIP and TUBING

if not superior to that produced by more complicated sequences. Cost has been low, and the production has been twice that originally expected.

Duplicator Converts Lathe

High machine speeds, simple setup and better surfaces are advantages claimed

HIGH - PRODUCTION machine, claimed to be capable of stepping up machining speeds, simplifying setup procedure and improving surface finish, has been installed on the big Bullard vertical turret lathe in the jet assembly department, of Ryan Aeronautical Co., San Diego, Calif. It is a Turchan hydraulic duplicator. This device converts the vertical turret lathe into an automatic production tool with time savings approaching 100 per cent.



MORE JET COMPONENTS
. . . time savings are substantial

It consists of a motor-driven hydraulic pump which supplies uniform oil pressure of 500 psi to a sensitive valve and master control cylinder. The valve is actuated by a tracer point which feels the outlines of a pattern, or template and meters oil directly to the control cylinder. The piston in this cylinder moves a tool slide which supports the cutting tool. When attached to the turret lathe, the duplicator accomplishes exact duplicates of master patterns directly in metal.

Typical application illustrating the versatility of the machine is demonstrated in the machining of flanges

Molding Machines

New Bulletin describes SPO line of Jolt Pin Lifters

Complete data on the Series 3000 high-production jolt pin lifters are presented in this new illustrated catalog which is available to foundry management and purchasing personnel such as superintendents, foremen, production expediters, etc. Designed for maximum speed, safety and ease of operation, these machines feature the patented SPO "inverted jolt" mechanism.

The jolt pin lifters described in this publication have jolt capacities ranging from 750 to 4000 pounds and are fully adjustable to meet diversified production demands. Pivot type adjustable lifting pins will accommodate any type or size of flask within their capacities. Both breakaway and secondary draw speeds can be adjusted to different job requirements, and jolt impact intensity of each machine is variable.

In this catalog, dimensions, capacities, pattern draw, SPO vibrator size and other pertinent data are tabulated for quick reference. Photographs and line drawings depict the construction and features of the various machines.

Bulletin No. 30 will be sent upon receipt of coupon or letterhead request.

125-31

SPO INCORPORATED

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SPO, Incorporated

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Century

Serves the Electric Motor User in Two Important Ways:

1. Century motors are designed and constructed for a long, dependable operating life.

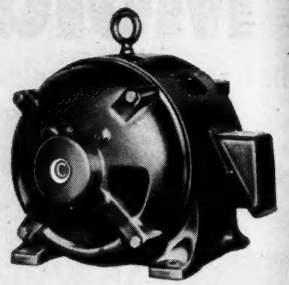
2. Just as important—they are skillfully selected to match the operating characteristics of the many kinds of equipment they drive.

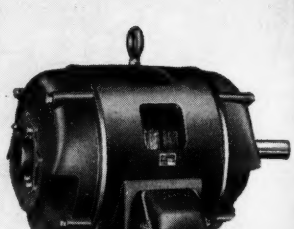
IN CENTURY'S wide range of types and sizes (up to 400 H.P.) there are available: 4 standard classes of starting torque characteristics—6 methods of speed control—constant and short time ratings—4 basic classes of frame protection against atmospheric hazards—a dozen methods of mounting the motor to the equipment—plus many special specifications to meet the requirements of the BIG NAME equipment manufacturers who use Century motors as a component part of their equipment.

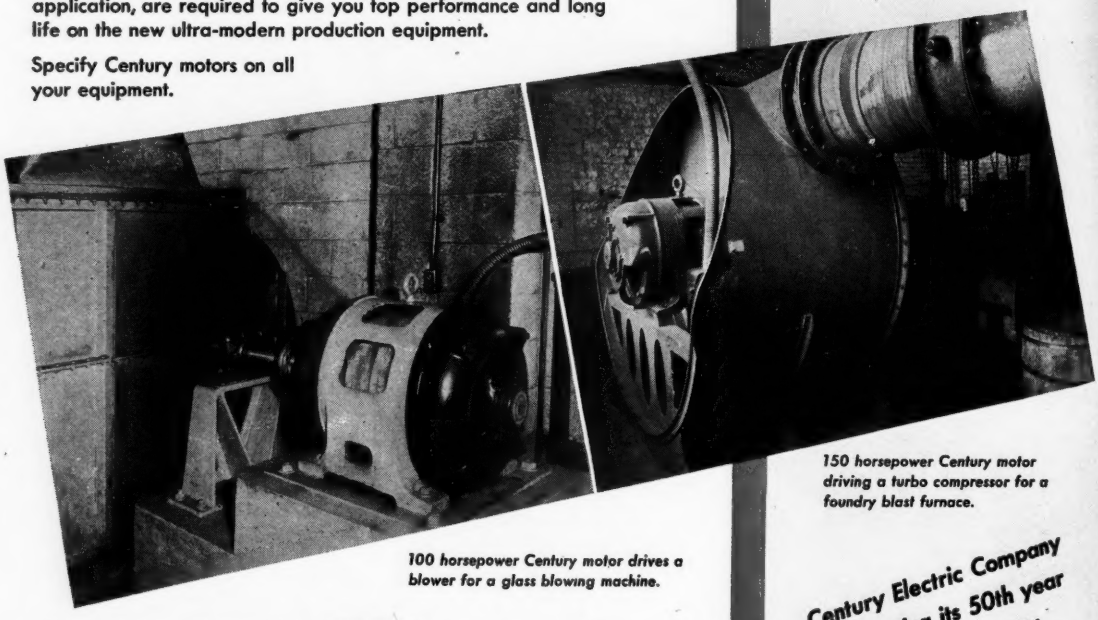
Teamwork with equipment producers gives you skillfully selected motors from Century's wide range of types and sizes . . . properly applied to match the performance characteristics of the machines they drive.

Both a properly designed and constructed motor, plus skillful application, are required to give you top performance and long life on the new ultra-modern production equipment.

Specify Century motors on all your equipment.







100 horsepower Century motor drives a blower for a glass blowing machine.

150 horsepower Century motor driving a turbo compressor for a foundry blast furnace.

Century SERVICE Is Near Any CENTURY Motor Driven Equipment

Prompt Service is offered by CENTURY'S National Network of more than 200 Authorized Service Stations, supervised by 28 Century Sales offices.

1. Facilities for immediate exchange of most CENTURY standard ratings of standard construction are available at CENTURY Authorized Service Stations.
2. CENTURY Authorized Service Stations are qualified and equipped to service and repair any piece of CENTURY apparatus.
3. Genuine CENTURY renewal parts are available at CENTURY Service Stations, CENTURY Parts Distributors and at the factory in St. Louis.

Century Electric Company is celebrating its 50th year in the electrical industry

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Offices and Stock Points in Principal Cities

Century C MOTORS

704

on the exhaust cones for General Electric J-47 jet engines. A template, conforming to the desired contours of the flange, is clamped to the tracer table. The sensitive tracer point is located on the template and the cutting tool is positioned on the flange in exact relationship by means of a micrometer-dial locating control. As the tracer point moves over the outlines of the template, its movement is picked up by the precision valve and translated into the most minute changes in direction of hydraulic oil which is piped to the master control cylinder. The master control piston moves in strict conformity with the oil pressure changes in the lines and operates the cutting tool so that it instantly and faithfully follows the direction of the tracer. Accuracies in duplication within variations of 0.002-inch are obtained.

According to Ryan, this method of generating work shapes from a model has many advantages over conventional methods. Smooth continuous operation of the turret lathe power feed coupled with the floating hydraulic action of the duplicator produces machined work of unsurpassed smoothness—often so smooth that final grinding can be eliminated. Also, it eliminates use of costly form tools and permits utilization of conventional tools which are simple to set up.

Novel Warehouse Planned

A four-story warehouse being erected at East Pittsburgh by Westinghouse Electric Corp. will rank among the most modern in the country, according to E. H. Baird, Westinghouse superintendent of shipping.

Among devices to speed flow of materials in and out of the building will be specially-designed pallet-handling cranes, an electric eye "traffic cop," floating shipping docks that adjust to various truck heights, and a tele - talk communication system for last minute instructions.

"Wherever possible, we will use belt conveyors and endless chains to move goods easily and quickly, and we'll even have a special conveyor to handle the paper work that is a necessary part of any shipping operation," Mr. Baird said.

Five tram-rail cranes, each with a capacity of two tons, will cover the entire length of the ground floor to facilitate loading of trucks and railroad cars. A spur line of the plant railroad will lie along one side of the building, and a dock, capable of accommodating six large trucks, will be located at the south end of the building. A feature of the truck loading area will be a "floating" dock. Length of the dock will be divided into six sections, each of which can be raised or lowered to conform to the varying heights of truck beds.

At each end of the building, there will be a combination freight and passenger elevator, which will have automatic pushbutton operation. Another special feature will be a conveyor belt to carry products arriving at the warehouse to the second and third floors of the building.

As materials are placed on the conveyor, they will be tagged as to whether they should go to the second or third floor. An electric eye will divert all the second floor material, but will permit the balance to be carried to the third floor.

The second floor, part of which will be used for storage, will be furnished with pallet racks capable of storing pallets in a triple layer. Two unique cranes, each with a capacity of two tons, will handle these pallets. Instead of the conventional hooks and cables, cranes will be equipped with a solid steel rod extending from the crane carriage to the floor level.

A fork designed to slide under the pallets will move up and down the steel rod. In this way the crane operator will be able to maneuver his

Spincraft
SKILL WILL DO IT ®

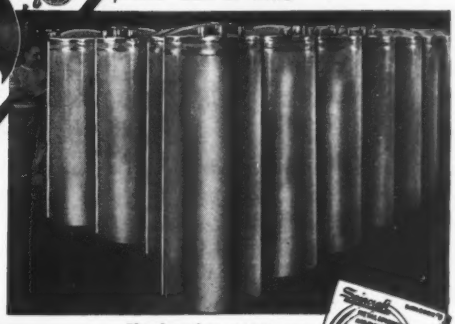
Production Methods Help You Gain Months of Time

Costs are *much* *lower*, too

Whenever emphasis is on speed in delivery, or lower costs, consider Spincraft metal fabricating. Of all methods available for cold shaping flat or rolled sheet metals, the spinning lathe, plus special Spincraft forming skills, offers the fastest and least expensive means of getting production rolling. As an example, consider the parts and assembly for the water sterilizer unit illustrated here. From a scratch start Spincraft made required tools, produced components and assembly and began delivery ten days after receipt of the order. Months of time were gained, thousands of dollars saved.

Cases like this are everyday experiences at Spincraft — on both small and large runs. The answer you want cannot be guaranteed, but others have been helped so often and so well that Spincraft has become the world's largest metal spinning and fabricating plant. Call or write

Components for stainless steel water sterilizer — spun, fabricated and assembled in record time at lowest cost.



The function, scope, mechanics and economics of Spincraft metal spinning and fabricating are discussed in this stimulating 40-page, well-illustrated booklet. A copy is yours for the asking.

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SKILL WILL DO IT ®
INCORPORATED

Heretofore known as Milwaukee Metal Spinning Co.

4151 W. State St.
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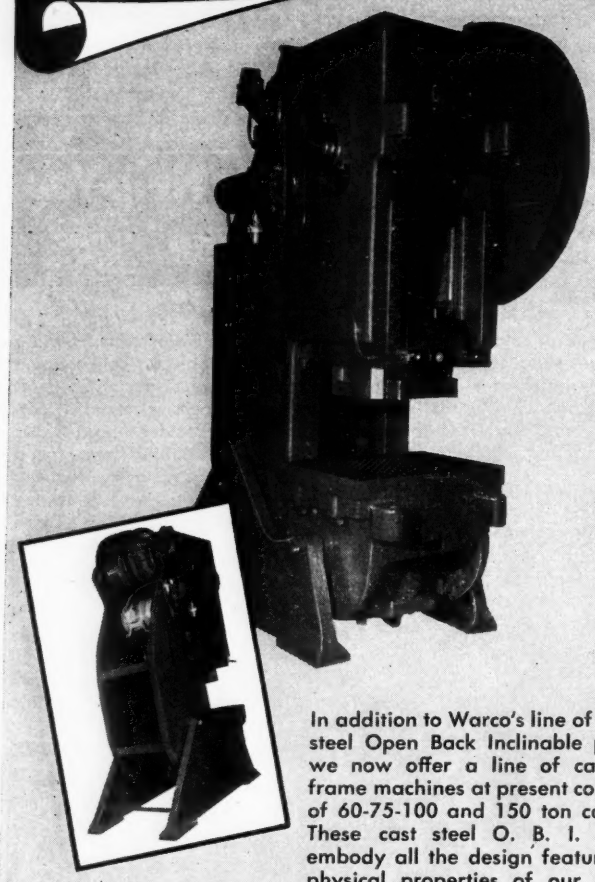
NOW AVAILABLE

Warco®

CAST STEEL O.B.I. PRESSES IN 60-75-100 and 150 TON CAPACITIES



In addition to Warco's line of welded steel Open Back Inclinable presses, we now offer a line of cast steel frame machines at present consisting of 60-75-100 and 150 ton capacity. These cast steel O. B. I. presses embody all the design features and physical properties of our welded frame press. Careful consideration has been given to proper distribution of metal so as to provide maximum stiffness and rigidity.

Warco is ready to meet your requirements, in choice of construction, with the latest design.

Contact your nearest representative or the factory direct.

Federal® WELDERS

THE FEDERAL MACHINE & WELDER COMPANY

WARREN, OHIO

Warco® PRESSES

crane into any aisle between the pallet racks and pick up any single pallet.

Also on the second floor will be one station of the endless chain that will operate between the second and third floors. The chain will carry small wire baskets from storage bins to the packaging area. Workers in the warehouse, when they receive an order for smaller articles that are generally stored in bins, will merely place these articles in the wire baskets, and they will then automatically be carried to the packing area.

The third floor will be used for bin storage and cartoning, and will also house the shipping department's offices. Cartons will also be stored on this floor. As materials are packaged on the second and third floors, they will be delivered to the shipping platform by spiral chutes.

Fourth floor of the building will serve as the general offices of the manager of the feeder and service division and his staff, as well as the works engineering offices.

Erection of the new building's steel frame work will begin about mid-September, and the structure will be ready for occupancy about January, 1952.

New Maintenance Manual

Care and maintenance of industrial trucks, important in protecting your investment and assuring continuity of service, is the subject of a manual published by Baker Industrial Truck Division, Baker-Raulang Co., Cleveland.

In the interest of more efficient, more continuous and more economical service from industrial trucks, this 16-page free bulletin contains 51 illustrations of the steps to be taken in preventive maintenance and annual check-ups.

Because of the high current labor rate and the scarcity of good skilled labor, major overhaul jobs should be kept to a minimum. With the mounting costs of essential wearing items, these materials should be conserved as much as possible. It is common sense to make the substantial savings that truck preventive maintenance affords and this manual tells how.

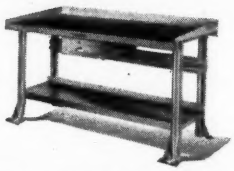
Copper Forging Book Revised

A revised edition of its handy reference booklet on copper and copper-alloy die pressed forgings, is announced by the American Brass Co. To materials engineers and product designers, the 12-page booklet provides practical, to-the-point, comparative illustrations to show what die pressed forgings are—what they can do—what they have already done—

A PRIZE...

IN ANY MAN'S LANGUAGE

HALLOWELL®



STEEL WORK BENCH!

Everyone dreams of hooking the *biggest* fish... everybody wants a *HALLOWELL* Bench. They're both *prizes* in any man's language!

The man who buys a HALLOWELL likes its *standard-unit design* which simplifies plant layout, its *tough, steel construction* which reduces maintenance and replacement for years to come, and its *trim, good looks* that improve shop appearance.

The man who works at a HALLOWELL likes its *smooth, splinter- and oil-proof, durable* work surface, its *rock-solid sturdiness* and its *convenience*.

Whether you buy or use work benches, you'll want to look over Bulletin 701.

Write for your copy today.

—SPS—

STANDARD PRESSED STEEL CO.

JENKINTOWN 33, PENNSYLVANIA

what a manufacturer can expect of them. Booklet contains tabulation of physical properties of copper and copper alloys suitable for forgings. For copies address request to Dept. DPF, Waterbury 20, Conn.

Stops Instrument Snowing

A novel use for a sub-zero industrial chilling machine has been reported by Lear Inc. of Grand Rapids, Mich., aircraft and radio accessories manufacturer. To prevent "snowing" in aircraft instruments subjected to the low temperatures of high altitudes, gases used to fill instrument cases are dehydrated in the minus 130° F temperature furnished by the unit.

Coils of copper tubing were installed in the cooling chamber of the R-120 chilling machine. Hydrogen and helium gases are forced through this tubing and quickly chilled to approximately minus 130° F. Water vapor in the gas condenses out in the form of ice crystals and fine snow. Condensate is trapped by filters before it can enter the supply line. The gases are warmed to room temperature before being used to fill the instruments.

Cooling coils are cleaned periodically by reverse-blowing the ice and snow out. Dry helium is used to purge the hydrogen coil and dry hydrogen to clean out the helium coil.

Due to sensitivity of components used in the production of Lear instrument products, it is necessary to remove every trace of moisture, even to the extent of the minute quantity found in and on the metal being used. Condensation in instruments at high altitudes and low temperatures may cause the vital aircraft instruments to become inaccurate or inoperative.

Additional details on industrial and commercial application of sub-zero temperatures are available on request to Sub-Zero Products Division, Deepfreeze Distributing Corp., Reading Rd., Cincinnati 29.

New Motor Bulletin Offered

Construction features of Allis-Chalmers large end - shield bearing squirrel-cage induction motors are described in a new bulletin. Built for a wide range of applications from central station auxiliary to general industrial drives, these motors are available in ratings and speeds up to 1750 hp at 1800 rpm.

Construction features of these motors, according to the producer, include welded stator yoke, long-life stator winding, capsule-type housings, split sleeve bearings, air-gap access holes, silver-brazed cage, protecting end shields, large discharge openings,

RELY ON Sperry

Ultrasonic

REFLECTOSCOPE

TEST NEW MATERIAL at the mill to improve quality and customer acceptance. TEST METALS PRIOR TO PROCESSING, MACHINING AND FABRICATING to avoid wasted machine time and manhours resulting from faulty materials. QUALITY CONTROL of work in process. MAINTENANCE INSPECTION to detect fatigue fractures. MEASURE PHYSICAL DIMENSIONS. Rely on the ultrasonic Reflectoscope to provide accurate inspection—instantaneously at low cost. Reflectoscopes are available for sale, for rent or lease.

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SPERRY Products, Inc.
DANBURY, CONNECTICUT

Please send me the following:

☐ REFLECTOSCOPE BULLETIN 50-105
☐ NAME OF NEAREST REPRESENTATIVE

NAME .....
TITLE .....
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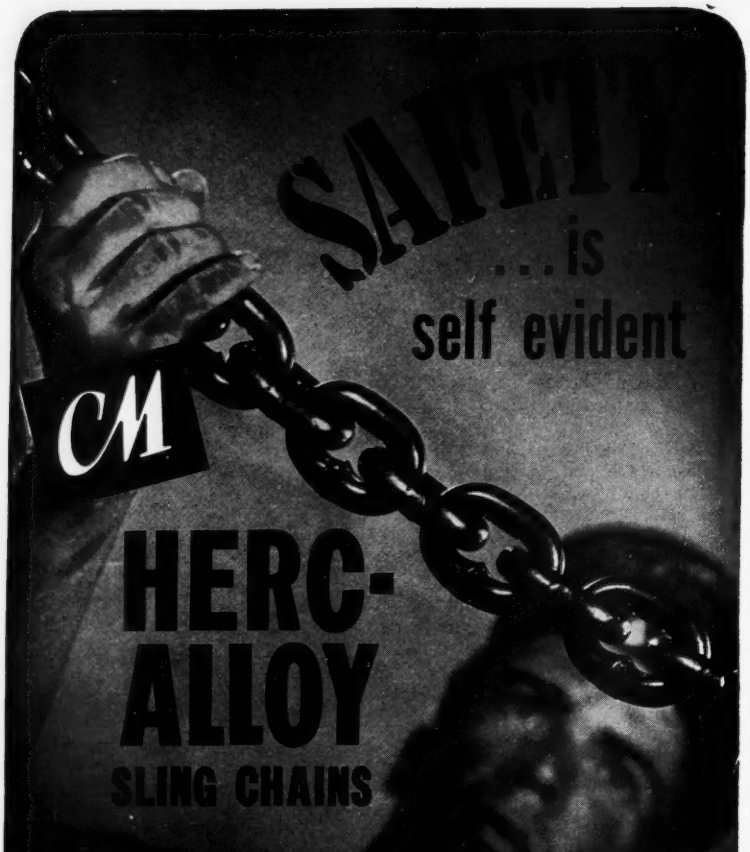
CITY ..... ZONE ..... STATE .....

SPERRY ALSO MANUFACTURES COUPLINGS, HYDRAULIC CONTROLS AND OTHER TESTING EQUIPMENT



HERC-ALLOY FEATURES

- America's *first* alloy steel sling chain... first to bear a serial number.
- Every CM HERC-ALLOY Sling Chain is alloy steel throughout...links, rings, hooks. There is only one grade... *the best.*
- Every chain is individually tested and accompanied by a certificate of registration.
- Links are side welded for maximum strength by patented INSWELL electric method.
- HERC-ALLOY Chains should *never* be annealed.
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● A simple visual inspection* is all that is needed to determine the continued serviceability of a HERC-ALLOY Chain. That's why more and more of the important companies are standardizing on HERC-ALLOY...because HERC-ALLOY Chains are immune to unseen dangerous crystallization...because you can see when a HERC-ALLOY Chain needs repairs or replacing.

*Write for your copy of this new, informative booklet. No charge.

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CHAIN CORPORATION

(Affiliated with Chisholm-Moore Hoist Corporation)

GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.

SALES OFFICES: New York • Chicago • Cleveland • San Francisco • Los Angeles

and inherently drip-proof design.

Motors can be had with special electrical modifications to suit application requirements. Although sleeve bearings are standard, motors may be obtained with capsule-type antifriction bearings whenever the speed and application are suitable. Numerous other mechanical modifications, such as double shaft extension or three-bearing construction, are also available. Terminal boxes for all leads are standard for many ratings and can be added for all ratings.

Copies are available upon request from the company, 1021 S. 70th St., Milwaukee.

Furnace Loading Time Slashed

Mechanized materials handling has reduced the loading time on five annealing furnaces from all day to 2 hours at Fafnir Bearing Co., New Britain, Conn. Fafnir produces bearings, ranging from three-eighths of an inch to 19 inches in diameter, which are used in almost every type of machine from adding machines to zipper makers. Floor space in the four Fafnir plants in New Britain totals nearly 19 acres in four and six-story buildings.

Fafnir uses its materials handling equipment in both standard and unusual ways. Virtually all parts are carried by fork lift or platform trucks at some stage of production. Trucks used for this purpose include 2000 - pound capacity electric-powered Automatic fork trucks, equipped with rollover forks, and platform-type driver-led Transporters, all made by Automatic Transportation Co., Chicago.

Typical operations include intra-departmental runs of from 200 to 600 feet with bins of partly finished products. This operation, the user reports, has saved a high percentage of handling costs.

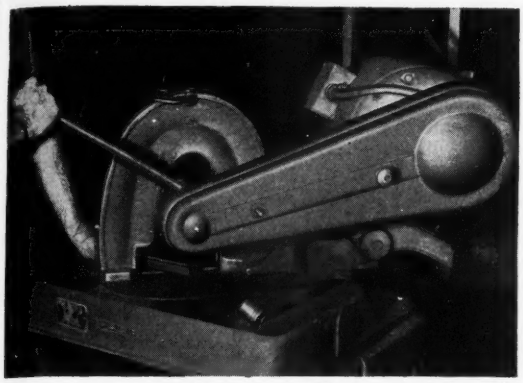
A "let's try it" attitude is prevalent throughout the plant. Their method of loading the annealing furnaces with forged rings or hoods in cast-iron bins is part of this. The fork truck takes the bins and places them three-in-a-row on the furnace car, which the fork truck then pushes into the furnace.

Another problem solved by mechanical methods is chip and scrap handling. Here, Automatic's rollover forks are employed to dump the entire load directly into bins or highway trucks. This technique produced a considerable saving in handling, and the fork truck paid for itself in less than a year.

In Fafnir's Washington street plant one Transporter is used for several floors. A small elevator pro-

3 TESTED WAYS

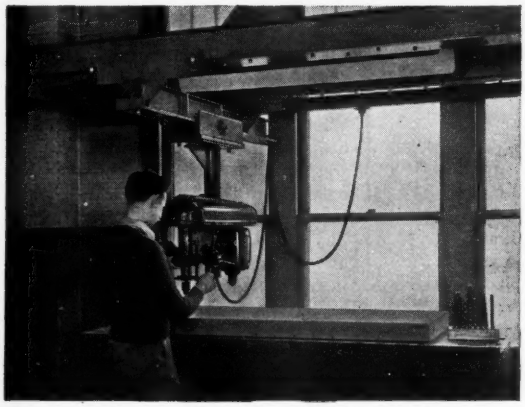
to Save Time, Space or Handling with DELTA Tools



Automotive moulding cut-off speeded 1000%

FOUR WHEEL DRIVE AUTO COMPANY . . . .

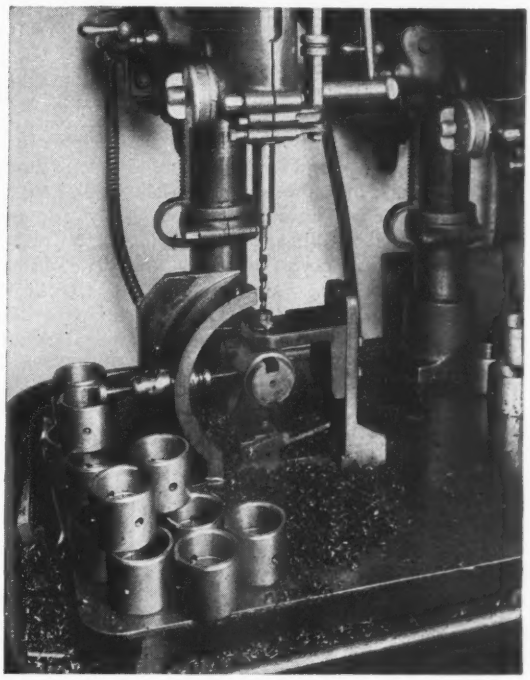
Clintonville, Wis. All metal moulding used for truck cabs is cut on Delta abrasive wheel cut-off machine, with ten times faster production. Previous hand cutting methods entailed great operator fatigue and required a deburring operation. Delta cut-off machines are also available with saw blades for non-ferrous work.



Overhead mounting for Delta drill press reduces handling of bulky panels

KIRKHOF ELECTRIC CO. . . . Grand Rapids, Mich.

With an overhead crane mounting, a Delta 17-inch drill press will drill holes in any location on 36″ x 96″ switchboard panels without moving the panels. Both the drill head and bridge are suspended from ball bearings riding on flat cold rolled bars; and the whole framework is supported from the building steel structure for a clear field of operation. Panels are 1½″ ebony asbestos or ⅛″ steel.



With one fixture, Delta drill press handles 57 different parts—REED-PRENTICE CORP. . . .

Worcester, Mass. A single ingenious jig, easily and quickly adjustable, is used to drill equally spaced holes in 57 different parts, with a big saving in tool storage space and manufacturing time. An arbor-holding bracket is adjustable horizontally and vertically, and an indexing pin in a double quadrant, inserted in the first hole drilled, locates the next hole accurately.

Delta users originate many unique and practical applications because Delta tools are so adaptable to so many jobs. Your Delta dealer will help you fit them to your own machining requirements. He's listed in the classified section of your phone book —under "Tools."

There's a Delta Power Tool for Your Job-

WOOD OR METAL WORKING

53 MACHINES — 246 MODELS — MORE THAN 1300 ACCESSORIES

DELTA MILWAUKEE

DELTA POWER TOOL DIVISION

Rockwell MANUFACTURING COMPANY

629K E. VIENNA AVENUE, MILWAUKEE 1, WISCONSIN

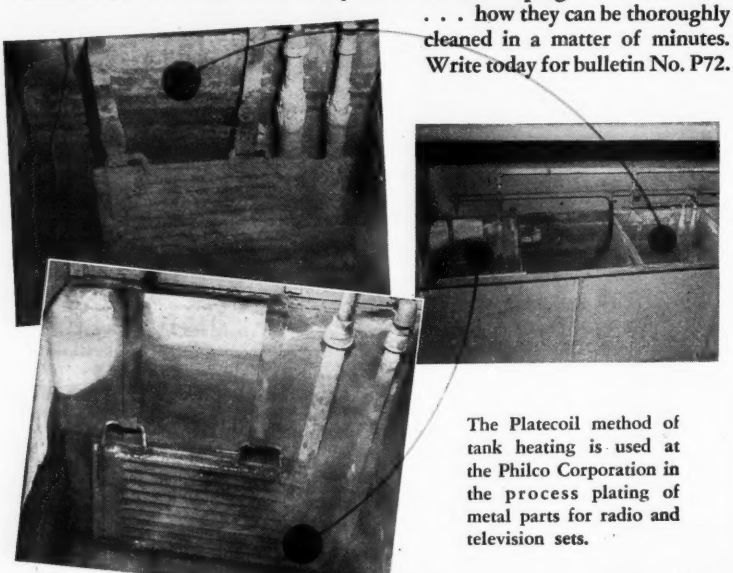
PHILCO finds

"platecoils have better heat conductivity than any similar coil"

The Platecoil method of tank heating is being used by the Philco Corporation of Philadelphia in the process plating of metal parts for radio and television sets. Although the Platecoils haven't been used very long, Philco production officials say they are "most pleased with the results that have been thus far obtained." They've found that, at least in their operation, the Platecoils are self cleaning . . . which saves many hours of maintenance time. They've found, too, that Platecoils have a much higher rate of heat conductivity . . . which means faster tank heating.

Platecoils have a greater BTU transfer because they have more prime surface in a given area. A 22"x47" Platecoil gives the same heat transfer surface as 32 ft. of 1½" pipe. Thus Platecoil saves about 50% over equivalent pipe coil. Think what this means to you in lower initial cost, lower installation and handling costs.

Learn too, how Platecoils can be replaced without dumping the tank solution . . . how they can be thoroughly cleaned in a matter of minutes. Write today for bulletin No. P72.



The Platecoil method of tank heating is used at the Philco Corporation in the process plating of metal parts for radio and television sets.

PLATECOIL gives you these ADVANTAGES

- Cleaned and Repaired Without Dumping Tank Solution
- Greater BTU Transfer Per Unit Area
- Weighs Only Half as Much as Pipe Coil
- No Threaded Joints in Tank
- Increased Tank Capacity
- Fast, Easy Installation
- Easy to Clean

PLATECOIL
Division
KOLD-HOLD MFG. CO.
LANSING 4, MICHIGAN

See us at the METAL SHOW—BOOTH G-345

vided a bottleneck, but the unit was able to ride the elevator with its load and deliver it on any floor. The transportation maintenance foreman says that this was the only solution to the problem of mechanizing materials handling within the building.

Aluminum Automotive History

You've probably seen a lot of information in print recently about General Motor's exciting "car of the future" called Le Sabre. This 1960 dreamboat is largely made of lightweight aluminum and magnesium—except for a few chassis parts.

The idea of aluminum automobiles is wonderful but not at all new. In the early days of the automotive industry Europeans promoted the aluminum car. Cars over there were taxed partly on their weight; and owners expected to drive them for 10 or 12 years. Europeans said that cars with an aluminum body used less gasoline, wore out fewer tires and lasted longer.

In America during 1903 aluminum bodies appeared in such cars as the White, Peerless, Pope-Toledo and White Steamer, Pierce-Arrow, Duesenberg, Franklin and Jordan also adopted the aluminum body.

During the 1920s Aluminum Co. of America decided to build all-aluminum cars. Altogether, they designed and constructed 15 aluminum cars (actually they were 85 per cent aluminum)—11 six-cylinder and 4 four-cylinder jobs, plus one extra chassis. These first cars, like the aluminum car of today, were experimental. But one clicked off 120,000 miles.

Aluminum cars, lighter than standard models by nearly 1000 pounds, were built at three Alcoa plants. Not only were the bodies made of aluminum but so were the frame, gasoline tank, spring brackets and hangers, steering gear housing, steering gear levers, tie rod and drag link, brake levers, front axle beam, rear axle housing, brake shoe supports, brake drums, wheels with integral hubs, radiator shell, fenders and splash pans, cylinder block, crankcase, cylinder head, intake manifold, timing gear cover, oil pan, pistons, connecting rods, oil pump, clutch cover, transmission case and torque tube and hound rods.

But just as prospects looked good, low cost steel sheets came into the picture and temporarily relegated the aluminum car body to the museum. Steel sheets were rolled wide enough so that only one stamping operation was needed instead of a number of different operations. Consequently

In your process . . .

HOW HOT IS HOT?

To meet the requirements of today's high-temperature processes, ALCOA Aluminas are helping refractory manufacturers revise our concept of "how hot is hot." Operating temperatures that were once inconceivable are common today. Yet new processes and speeded production are pushing even those temperatures higher and higher.

Modern operators are using refractories fortified with ALCOA Alumina to increase the output of their metallurgical furnaces, chemical processing kilns, glass tanks and other high-temperature equipment. They know that these refractories *considerably reduce down time!* And down time costs more than good refractories.

Even at moderate temperatures, a *little* ALCOA Alumina in refractories makes a marked difference, but the higher the alumina content, *the better the performance.* Strength and stability are improved . . . resistance to spalling, abrasion and fluxing is increased . . . thermal and mechanical shock resistance is improved. Such refractories are being successfully used up to 3650° F.

Perhaps refractories fortified with ALCOA Alumina are the answer to *your* extra high-temperature requirements. Let us discuss them with you. We'll gladly refer you to reliable sources of supply. Write to: ALUMINUM COMPANY OF AMERICA, CHEMICALS DIVISION, 622J Gulf Building, Pittsburgh 19, Pennsylvania.

Alcoa Chemicals

ALCOA ALUMINUM

ALUMINAS and FLUORIDES

ACTIVATED ALUMINAS • CALCINED ALUMINAS • HYDRATED ALUMINAS • TABULAR ALUMINAS • LOW SODA ALUMINAS ALUMINUM FLUORIDE • SODIUM FLUORIDE • SODIUM ACID FLUORIDE • FLUOBORIC ACID • CRYOLITE • GALLIUM

FULL SPEED AHEAD

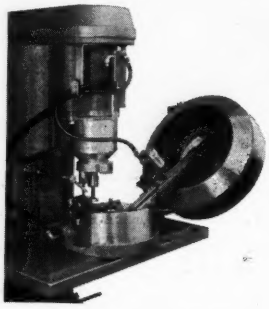
IS THE PRESENT-DAY DEMAND

and You Can Command It With

D.P.S. MOTORIZED
Selective Feeding
HOPPER UNITS

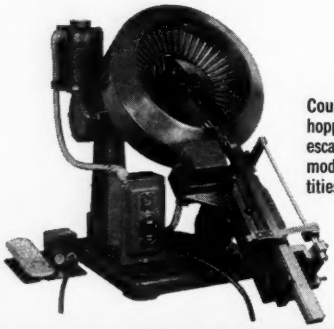
Hopper feeding 30 caliber shell discs, concave side up, to press for drawing operations.

Modern production methods demand more speed and accuracy in the selection and feeding of parts than can be accomplished by hand . . . Our 25 years experience as pioneers in the assembly field enables us to ably meet this demand with the D.P.S. Motorized Hopper Units, the outstanding selective feeding devices with which production parts of a wide variety are selected, oriented and fed in a given position for primary and secondary operations . . . They are a completely self-contained unit, including drive and feed track. They are easily adaptable to presses, centerless grinders, thread rolling and slotting machines, also special machines . . . Six sizes, 8", 10", 12", 16", 24" and 30" diameters for handling various sizes of parts. No matter what your feeding problem is, we can meet your requirements. Designers of special equipment will also be interested.



Sixteen-inch hopper mounted on tapping machine equipped with air-operated dial—completely automatic operation.

Send for further details, also information about D.P.S. Power Screwdrivers, Nut Drivers and Special Assembling Machines.



Counting and feeding hopper with adjustable escapement to accommodate varying quantities.

1926 Our 25th ANNIVERSARY 1951

DETROIT POWER SCREWDRIVER CO.

2811 W. FORT ST. DETROIT 16, MICHIGAN

price ruled out the aluminum model.

One of Alcoa's aluminum automobiles now is a show piece at the Daimler Ltd. Museum, in England. Another is in Henry Ford's Greenfield Village at Dearborn, Mich. Several other aluminum cars, long used at Alcoa's Cleveland plant as courtesy cars for visitors, were retired in the early 1930s. Though the aluminum body was discarded, dozens of other parts are today produced of aluminum. Millions of parts and millions of pounds of aluminum have since poured into the automotive industry each year.

Induction Heater Ups Output

Induction heating at De Laval Steam Turbine Co. has cut coupling bolt hardening costs 70 per cent according to S. P. Felix, superintendent of the company's Standard Products Division.

Used for hardening bolts after machining, the induction heat process also gives them correct hardness and distortion-free properties, he said.

"We formerly had to harden a piece first, then machine it. But now, with induction heating, we can finish machine it, then harden it. The result is as distortion-free as if we had machined it after hardening. This has eliminated two operations".

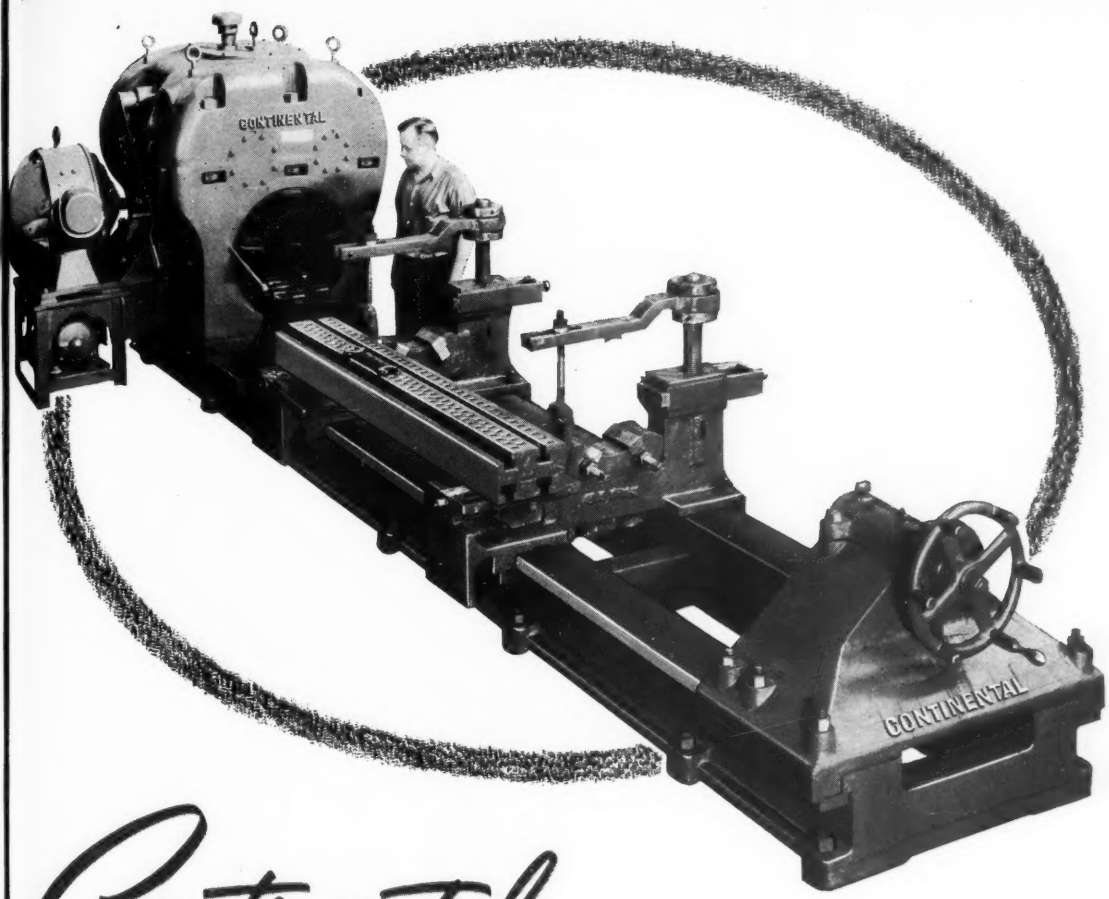
"Lead time" on the hardening operation has been cut from three days to a few hours on a given batch. Formerly, they had to heat furnaces for small runs, or hold jobs until enough pieces had accumulated to justify a run. This slowed down production and increased "lead time".

According to Mr. Felix, DeLaval installed the General Electric heater "in order to reduce the number of operations, which in turn would decrease our costs." He also emphasized that use of induction heating gives them better control of heating depth, which determines the quality of each piece.

Core Bulletin Offered

A new 12-page engineering bulletin illustrated with graphs demonstrating behavior characteristics of each of its three grades of metallic oxide Ceramag cores under varying conditions of permeability, flux density, temperature, and other magnetic properties is available by request on your letterhead to Stackpole Carbon Co., St. Marys, Pa.

These nonmetallic cores have found wide-spread use in TV flyback transformers, deflection yokes, image width controls and other applications where high permeability for relatively low flux densities and medium fre-



Continental ROLL LATHES

CASTINGS: Carbon and Alloy Steel; from 20 to 250,000 Pounds.

ROLLS: Iron, Alloy Iron and Steel; for All Types of Rolling Mills.

MILLS: Complete Installations of Rolling Mills and Auxiliary Equipment.

CONTINENTAL
Foundry & Machine Company

CHICAGO ★ PITTSBURGH
Plants at East Chicago, Ind., Wheeling, W. Va., Pittsburgh, Pa.

100% Alloy recovery

WITH AJAX-NORTHRUP INDUCTION HEAT

Ajax-Northrup furnaces are famous for their ability to give back what you put into them. They melt any metal with minimum losses, at high speeds, and with extremely accurate control of analysis and pouring temperatures.

For example, a foundry using these furnaces to melt stainless steel for corrosion and heat resistant castings reports the following figures on recovery of elements going into the make-up of 18-8 type alloys:

Ni: 100% Cr: 99% Mn: 90%
Si: 94% Mo: 95% Cb: 92%

Another Ajax user saves $60,000 a year just by reducing chromium losses alone. Still another controls pouring temperatures within 20 deg. F., turns out castings so perfect that repair welding has been eliminated.

Ajax-Northrup can save metals and money for you, too. Write us today for details.

SEND FOR NEW INDUCTION HEATING AND MELTING BULLETIN

134

FOR HEATING AND MELTING

AJAX NORTHRUP

AJAX ELECTROTHERMIC CORPORATION

AJAX PARK
TRENTON 5, NEW JERSEY

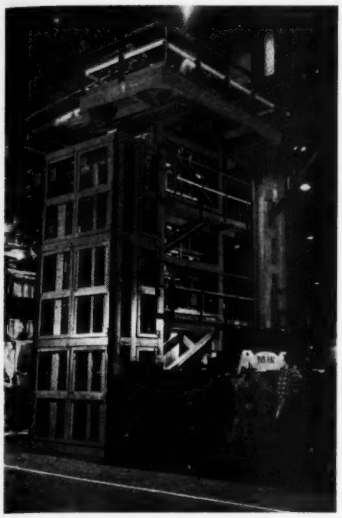
Associate Companies

AJAX ELECTRO METALLURGICAL CORP.
AJAX ELECTRIC FURNACE CORPORATION
AJAX ELECTRIC COMPANY, INC.
AJAX ENGINEERING CORPORATION

quencies is required. Particularly valuable for the design engineer, the bulletin will suggest many new ways of lowering costs and raising efficiency of modern electronic equipment.

Reflow Line Moves at 2500 Fpm

Tin plate moving at 2500 feet per minute is heated to the melting point of the tin in less than one-quarter second by 1800 kilowatts of radio-frequency power on the No. 4 electrolytic tin plate line at Weirton Steel Co., Weirton, W. Va. The high



RF HEAT WORKS AT HIGH SPEED
... 1800 watts do the job in 5½ feet

frequency tin reflow equipment was designed and built by Westinghouse Electric Corp., Pittsburgh.

Five induction coils in the tower are used to transfer power to the strip. The active heating zone is only 5½ feet long, being equal to the length of the five coils.

Power density is as high as 400 kw per lineal foot of tin plate. It is great enough to produce a sharp line of demarcation across the material at the melting point of the tin, called the flow line. Use is made of this flow line to hold constant the temperature to which the tin plate is heated.

Offers Die Setting Manual

Cerro de Pasco Corp. (formerly Cerro de Pasco Copper Corp.) has just released a 20 - page illustrated manual describing their Cerromatrix method of punch and die setting. It is filled with practical information regarding application of the method of making various types of dies. Copies are available on request from 40 Wall St., New York.

here's the surest way
OF APPRAISING FIRE PROTECTION

TO be best evaluated, fire protection must be considered in the light of known results . . results that when honestly measured, are evidenced in the qualities of *Assured Service . . . Approved Safety . . .* and *Accepted Savings.*

SERVICE From a *Service* point of view, "Automatic" Sprinklers stand on their record of past performance . . . safeguarding commercial and industrial enterprise from fire for over half a century . . . extinguishing small fires at their inception before major conflagrations can develop.

SAFETY "Automatic" Sprinkler's record of approved *Safety* is attested in the reports of all leading insurance authorities.

SAVINGS The fact that the cost of "Automatic" Sprinkler protection at Buhl Sons Company, Detroit, Michigan, will be paid for by means of reduced insurance rates in about 15 years (nearly 7% per annum), substantiates their acceptance as *Savings.*

You will find it wise to plan adequate fire protection for your business property now, and in that planning, give careful consideration to those qualities of Service . . . Safety . . . and Savings. "Automatic" Sprinklers continue to offer all three. They're *an important investment today . . . perhaps welcomed protection tomorrow.*

"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA
YOUNGSTOWN 1, OHIO

TYPICAL "Automatic" Sprinkler PROTECTED PROPERTIES
Industrial Plants · Storage · Warehousing · Mercantiles
Piers · Aviation Properties · Hospitals · Institutions
Hotels · Apartments · Schools · Public Buildings

"Automatic" Sprinkler
FOR INVESTMENT PROTECTION
DEVELOPMENT · ENGINEERING MANUFACTURE · INSTALLATION
OFFICES IN PRINCIPAL CITIES OF NORTH AND SOUTH AMERICA

CALENDAR OF MEETINGS

† Denotes first listing in this column.

September 14-16, American Society of Sanitary Engineering: National convention, Hotel Statler, Detroit. Society address: 1308 Freemont St., McKeesport, Pa. Secretary: T. M. Dugan.

September 16-19, American Institute of Chemical Engineers: National meeting, Hotel Sheraton, Rochester, N. Y. Institute address: 120 E. 41st St., New York 17. Executive secretary: Stephen L. Tyler.

September 17-19, Allied Railway Supply Association: Fall meeting and exhibit, Hotel Sherman, Chicago. Association address: Box 5522, Chicago 80. Secretary: Charles F. Weil.

September 21-23, National Association of Waste Material Dealers Inc.: Fall meeting, Saranac Inn, Upper Saranac Lake, N. Y. Association address: 1109 Times Bldg., New York 18. Secretary: Clinton M. White.

September 24-25, Steel Founders Society of America: Fall meeting, The Homestead, Hot Springs, Va. Society address: 920 Midland Bldg., Cleveland 15. Secretary: F. Kermit Donaldson.

September 24-25, American Coke & Coal Chemicals Association: Annual fall meeting, Skytop Lodge, Skytop, Pa. Association address: 711 14th St. NW, Washington. Executive secretary: Samuel Weiss.

September 24-26, National Truck Body Mfrs. & Distributors Association: Annual convention and suppliers exhibit, Chalfonte-Haddon Hall, Atlantic City, N. J. Association address: 346 Connecticut Ave. NW, Washington. Secretary-manager: Shipley D. Burton.

September 25-28, American Society of Mechanical Engineers: Fall meeting, Hotel Radisson, Minneapolis. Society address: 29 W. 39th St., New York. Secretary: C. E. Davies.

September 26-29, Marking Device Association: National convention, Edgewater Beach Hotel, Chicago. Association address: 134 N. La Salle St., Chicago. General manager: E. F. Way.

September 27-30, Multiple V-Belt Drive & Mechanical Power Transmission Association: Annual meeting, The Broadmoor, Colorado Springs, Colo. Association address: 7 W. Madison St., Chicago 2. Executive Secretary: Harry P. Dolan.

OCTOBER

October 1-2, American Machine Tool Distributors Association: Annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Association address: 1900 Arch St., Philadelphia. Executive secretary: Thomas A. Fernley Jr.

October 1-4, Association of Iron & Steel Engineers: Fall meeting, Sherman Hotel, Chicago. Association address: 1010 Empire Bldg., Pittsburgh. Managing director: T. V. Ess.

October 2-4, Society of Industrial Packaging & Materials Handling Engineers: Exposition and "short course," Hotel Cleveland, Cleveland. Society address: 20 W. Jackson Blvd., Chicago. Secretary: H. E. Brill.

October 3-5, Pressed Metal Institute: Fall meeting, Drake Hotel, Chicago. Institute address: 13210 Shaker Square, Cleveland 20. Managing director: Orrin B. Werntz.

October 8-12, National Hardware Show: Grand Central Palace, Atlantic City, N. J. Managing director: Frank Yeager.

October 8-13, Concrete Reinforcing Steel Institute: Fall meeting, Grove Park Inn, Asheville, N. C. Institute address: 38 S. Dearborn St., Chicago 3. Managing director: H. C. Delzell.

October 9-12, The Electrochemical Society Inc.: Centennial—Fall convention, Hotel Statler, Detroit. Society address: 235 W. 102nd St., New York 25. Secretary: Henry B. Linford.

October 10-12, Porcelain Enamel Institute Inc.: Shop practices forum, Deshler-Wallick Hotel, Columbus, O. Institute address: 1010 Vermont Ave. NW, Washington. Secretary: Edward Mackaser.

October 11, American Iron & Steel Institute: Regional technical meeting, Hotel Warwick, Philadelphia. Institute address: 350 Fifth Ave., New York. President: Walter S. Tower.

October 12-14, Metal Treating Institute: Annual meeting, Detroit. Institute address: 271 North Ave., New Rochelle, N. Y. Executive secretary: C. E. Herington.

October 13-14, American Welding Society: Annual meeting, Book-Cadillac Hotel, Detroit. Society address: 33 W. 39th St., New York 18. Secretary: J. G. Magrath.

October 13-14, American Society for Metals: Annual seminar, Hotel Statler, Detroit. Society address: 7301 Euclid Ave., Cleveland. Secretary: W. H. Eisenman.

October 13-17, Packing Machinery Manufacturers Institute: Fall meeting, Mid Pines Club, Southern Pines, N. C. Institute address: 342 Madison Ave., New York 17. Secretary: Helen L. Stratton.

October 14-18, American Hardware Manufacturers Association: Fall meeting, Marlborough-Blenheim Hotel, Atlantic City, N. J. Association address: 342 Madison Ave., New York 17. Secretary: Arthur L. Faubel.

October 15-17, American Gas Association: Annual meeting, Kiel Auditorium, St. Louis. Association address: 420 Lexington Ave., New York 18. Secretary: Kurwin R. Boyes.

October 15-19, American Society for Metals: National Metal Congress & Exposition, Statler Hotel, Detroit and Michigan State Fairgrounds. Society address: 7301 Euclid Ave., Cleveland. Secretary: W. H. Eisenman.

October 15-19, The World Metallurgical Congress: Hotel Statler, Detroit. Sponsored by American Society for Metals. Manager: W. H. Eisenman; director: Dr. Zay Jeffries.

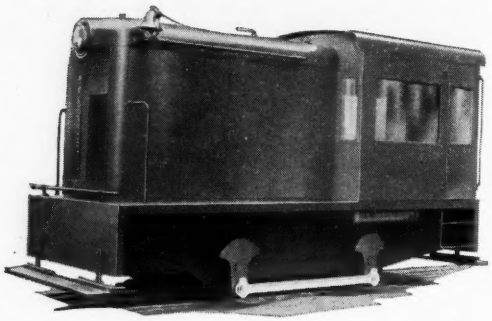
†October 16-19, Scientific Apparatus Makers Association: Record controller & midyear

(Continued on p. 138)

For Faithful and Profitable Performance

CHOOSE a DAVENPORT

At right is a 20-Ton, 24" Gauge, 0-4-0 Davenport Diesel Locomotive with Torque Converter Drive, engine rated at 153 h. p. at 1800 r. p. m.



Davenport Locomotives with Torque Converter drive are obtainable in a range of sizes, with either Diesel or Gasoline power. They offer smooth, quiet transition from one speed level to another; absence of engine slowdown during speed changes, freedom from transmission of load shocks or jerks; assure easier operation and greater work output.

DAVENPORT LOCOMOTIVES

Available in STEAM FIRELESS GASOLINE DIESEL with ELECTRIC or HYDRAULIC or MECHANICAL DRIVE

PORTER "Davenport Built" LOCOMOTIVES Established 1866

WRITE US TODAY

We Build to Meet Your Needs

You will obtain best results from FITTED POWER. Davenport engineers will be glad to receive a description of your operating conditions and haulage work to be done. They will analyze such data and, without obligation on your part, will recommend the locomotive best suited to deliver maximum work at lowest ton-mile costs.

Complete Information on Request

DAVENPORT LOCOMOTIVE Division

DAVENPORT BESLER CORPORATION — DAVENPORT IOWA, U.S.A.

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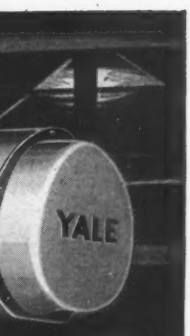
SPECIFIC PROBLEM . . .

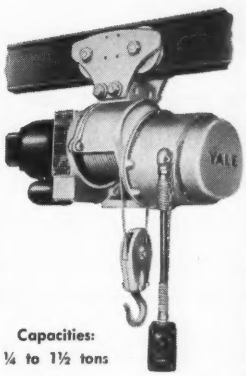
SPECIFIC ANSWER!

YOU'LL GET MORE DONE WITH A HOIST THAT'S EXACTLY RIGHT . . .



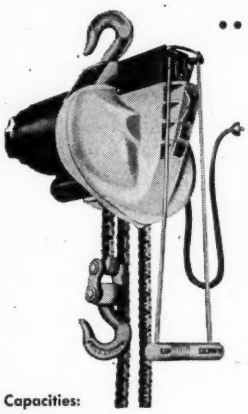
. . . for efficient quick-lifting power

YALE LOAD KING ELECTRIC HOIST



Capacities: ¼ to 1½ tons

Wherever a rugged, moderately priced, light-duty hoist is indicated, this new YALE is a "natural." It can stay on the job 'round the clock, lifting at speeds ranging from 9 to 41 F. P. M.! Push-button provides split-second one-arm control for easy "inching" and spotting of load. Motor and load brakes protect load and operator even when power is off. Available in wire rope or chain models with trolley, lug or swivel hook suspension.



. . . for dependable general-purpose lifting

YALE MIDGET KING ELECTRIC HOIST

Here's a YALE money-saver that fills the bill perfectly on a thousand-and-one lifting jobs. Get speedy lifting, fast, accurate spotting of loads. One-hand bar control leaves operator free to guide loads as he lifts or lowers. Non-fracturing steel load hook. Trolley or swivel hook suspension models available, AC or DC.

Capacities: ½ to 2 tons

and there are many more!

A YALE HOIST FOR EVERY JOB

Get all the facts today! ➡

The Yale & Towne Manufacturing Co., Dept. 89
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Philadelphia 15, Pa.

Please show me how I can step up production with YALE hoists.

_____ *Please have your local representative call on me.*

_____ *Please send me FREE detailed literature.*

Name_____

Company_____

Street_____

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YALE

MATERIALS HANDLING EQUIPMENT

THE YALE & TOWNE MANUFACTURING COMPANY

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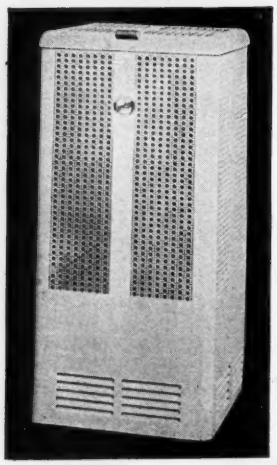
Hendrick Ornametal

TRADE MARK



Hendrick Ornametal is a decorative, lightweight metal grille suitable for a wide variety of applications, such as for stove panels as shown in the illustration.

Furnished in a wide variety of attractive designs, Ornametal is made of a special bright finish, cold rolled steel, suitable for painting or plating, and is available in a wide range of stock size sheets and gauges. Write for full information.

1876—Seventy-Fifth Anniversary—1951

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Perforated Metal Screens
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"New Process"
Punches • Dies • Rivet Sets
Compression Riveter Dies
Made from high-grade alloy tool steels properly heat-treated, of uniform high quality—may be purchased with complete confidence for maximum service.
Write for Catalog 46
GEO. F. MARCHANT COMPANY
1420-34 So. ROCKWELL ST., CHICAGO 8, ILL.

(*Continued from p. 136*)

meeting, Seaview Country Club, Absecon, N. J. Association address: 20 N. Wacker Drive, Chicago 6. President: Kenneth Anderson.

†**October 17-18, Steel Shipping Container Institute Inc.:** Fall meeting, Pierre & Hampshire House, New York. Institute address: 570 Lexington Ave., New York 22. Secretary: L. B. Miller.

†**October 18-20, Anti-Friction Bearing Manufacturers Association:** Fall meeting, The Homestead, Hot Springs, Va. Association address: 60 E. 42nd St., New York 17. Secretary-manager: H. O. Smith.

†**October 18-20, National Association of Corrosion Engineers:** Annual meeting, south-central region, Corpus Christi, Tex. Association address: 919 Milam Bldg., Houston 2. Executive secretary: A. B. Campbell; meeting chairman: George A. Mills.

October 19-20, American Society of Tool Engineers: Semi-annual directors' meeting & south-central regional meeting, Vendome Hotel, Indianapolis. Society address: 10700 Puritan Ave., Detroit 21. Executive secretary: Harry E. Conrad.

October 22-24, American Mining Congress: 1951 metal and nonmetallic mineral mining convention, Biltmore Hotel, Los Angeles. Congress address: Ring Bldg., Washington 6. Secretary: Julian D. Conover.

October 22-24, American Standards Association: Annual meeting & national standardization conference, Waldorf-Astoria Hotel, New York. Association address: 70 E. 45th St., New York. Secretary: G. F. Hussey Jr., Adm., USN, Ret.

October 22-24, Packaging Institute: Fall meeting, Commodore Hotel, New York. Institute address: 342 Madison Ave., New York 17. Secretary: Laurence V. Burton.

October 22-25, American Institute of Steel Construction Inc.: Fall meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute address: 101 Park Ave., New York 17. Executive vice president: L. Abbott Post.

October 22-25, The Wire Association: Annual convention, La Salle Hotel, Chicago. Association address: 300 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

October 22-26, American Association of Electrical Engineers: General fall meeting, Hotel Cleveland, Cleveland. Association address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

October 25-26, Gray Iron Founders Society Inc.: Fall meeting, Edgewater Beach Hotel, Chicago. Society address: 210 National City—E. 6th St. Bldg., Cleveland. Executive vice president: Donald H. Workman.

October 28-30, Conveyor Equipment Manufacturers Association: Fall meeting, The Homestead, Hot Springs, Va. Association address: 1129 Vermont Ave., Washington 5. Executive vice president: R. C. Sollenberger.

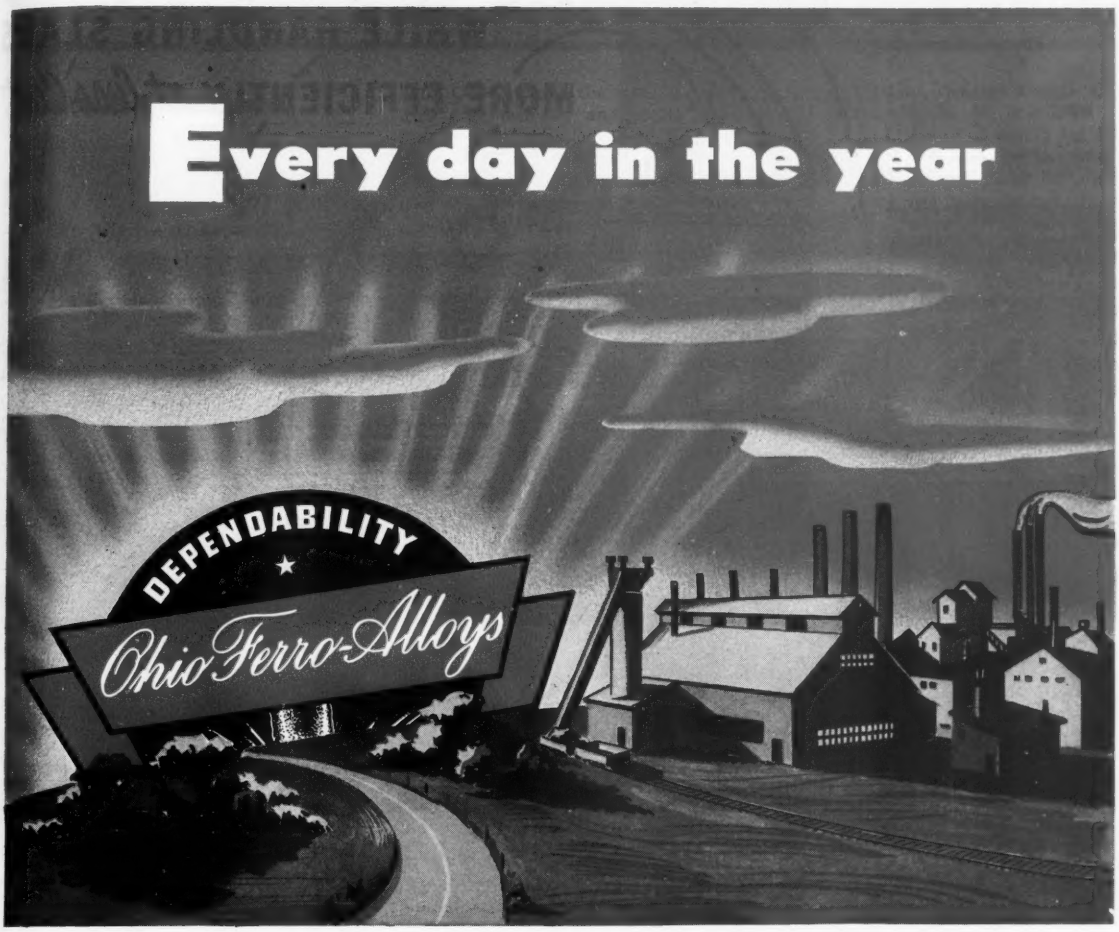
October 29-31, American Gear Manufacturers Association: Semi-annual meeting, Edgewater Beach Hotel, Chicago. Association address: 302 Empire Bldg., Pittsburgh 22. Secretary: Newbold C. Goin.

October 29-31, National Lubricating Grease Institute: Fall meeting, Edgewater Beach Hotel, Chicago. Institute address: 4638 Nichols Parkway, Kansas City 2, Mo. Executive secretary: Harry F. Bennetts.

October 31-November 2, Foundry Equipment Manufacturers Association: Fall meeting, The Homestead, Hot Springs, Va. Association address: Engineers Bldg., Cleveland 14. Executive director: Arthur J. Tuscany.

October 31-November 2, Porcelain Enamel Institute Inc.: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute address: 1010 Vermont Ave, N.W., Washington 5. Secretary: Edward Mackaser.

October 31-November 2, Association of American Battery Manufacturers Inc.: Annual meeting, Palmer House, Chicago. Association address: 2706 Tower Bldg., Akron. Secretary: V. L. Smithers.



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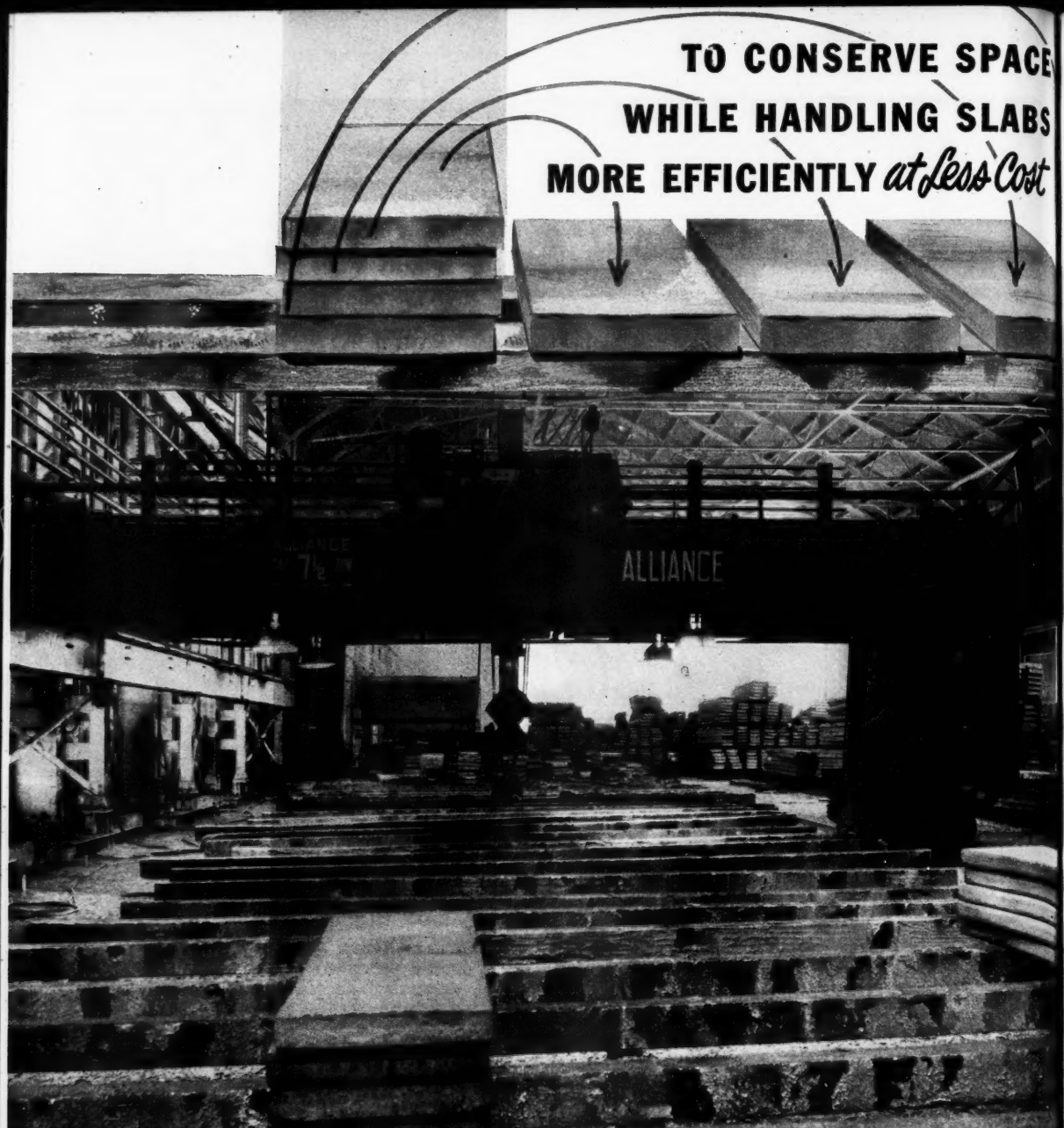
BIRMINGHAM DISTRICT—Schuler Equipment Company, First National Building, Birmingham, Alabama.



Alan Wood Steel Company uses *Alliance* telescopic crane

Alliance

LADLE CRANES • GANTRY CRANES • FORGING MANIPULATORS
SOAKING PIT CRANES • STRIPPER CRANES • SLAB AND BILLET
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THE ALLIANCE MACHINE COMPANY
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● Operating underneath the main overhead crane, this newly developed, stiff-leg, semi-gantry, 7½ ton Alliance Slab Handling Crane services the slab storage area of the building as it turns and positions heavy slabs on the scarfing bed.

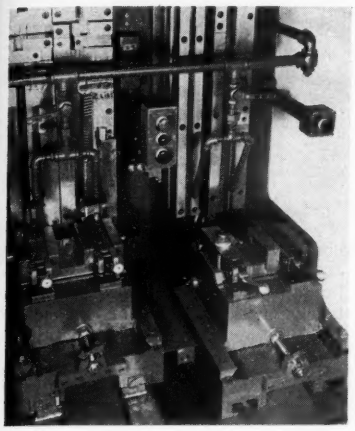
A minimum of headroom is required as this Alliance crane utilizes a special telescopic ram rather than a rack type ram to conserve overhead space. And, because of the compact design, this type crane can be installed where the rack type could not because it requires more headroom. The operator is located on the gantry leg level with his work for perfect visibility.

Alliance, with more than a half-century of crane building experience behind them, is continually developing new ways to give industry added lifting power at reduced costs. Call in your Alliance engineer today for a frank discussion of your heavy material handling problems. Be prepared now and tomorrow.

New Products and Equipment

Vertical Broach Improved

Improvements in its duplex vertical hydro-broach machine are announced by Cincinnati Milling Machine Co., Cincinnati 9, O. Built in 5 and 10-ton sizes, a 42 or 54-inch stroke can be furnished on the smaller model and a 54 or 66-inch stroke on the larger. Chief design improvement is in the table construction. Rams operate alternately up and down, cutting on the down



stroke. In front of each ram an individual table advances to cutting position and retracts to leading position, synchronized with the movement of the rams.

Protection of the hydraulic pump and valves is provided through fine mesh intake strainers and an efficient filter connected in parallel to the hydraulic circuit. A pressure gage indicates to the operator when the filter is becoming clogged and should be replaced. Preset cycle control, a safety feature formerly supplied as an attachment is now included with the standard machine equipment.

Check No. 1 on Reply Card for more Details

Large Steam Output

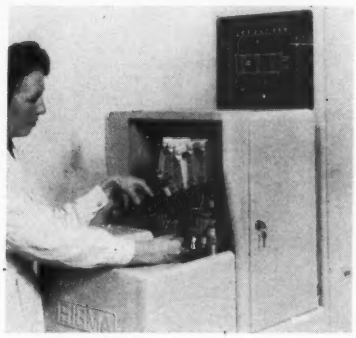
Vapor Heating Corp., 4501 W. 16th St., Chicago, Ill., announces its steam generator model 4740 for supplying large quantities of high-pressure dry steam. The unit develops 200 pounds steam pressure in 2 minutes from cold water and produces 4800 pounds of 99 per cent dry steam per hour at 82 per cent efficiency. Forced draft air and pressure atomized fire releases a million Btu's per cubic foot of combustion space. One electric motor (or gasoline engine on portable units) drives the water pump, fuel pump, blower and magneto. Once started the machine operates automatically and steam pressure may be changed from 75 to 600 psi by turning one control.

A servo control automatically modulates the machine to produce from one-third to full capacity. Safety controls such as steam temperatures limit control, stack temperature cut-out, safety valves, electric flame control, time delay relays and others have been incorporated into this machine. Overall size of the package unit is 52 inches wide, 76 inches long and 78 inches high.

Check No. 2 on Reply Card for more Details

Multiple Inspection

Multi-dimension inspection machine made in England by Sigma Instrument Co. Ltd., is being introduced in the U. S. by Cosa Corp., 405 Lexington Ave., New York 17, N. Y. Designed for 100 per cent inspection, machine checks simultaneously for inside and outside diameters, depths, profiles, tapers, concentricity, etc. In-



spection results are shown by signal lights on a panel: Within limits, a master green light; on the plus side, a yellow light for each dimension; and on the minus side, a red light for each dimension. As many as 28 dimensions of a turbine blade can be inspected simultaneously at 300 pieces per hour.

Available for hand, semiautomatic or fully automatic operations, the machine is made up of standard units. Tips of the measuring gages, work holders and loading magazines or hoppers are the only special parts required for individual setups.

Check No. 3 on Reply Card for more Details

Fan-Cooled Enclosed Motors

Tri-Clad line of single-phase capacitor motors has been extended to include a totally enclosed fan-cooled construction according to an announcement by Small and Medium Motor Divisions, General Electric Co., Schenectady 5, N. Y. Available in ratings of 1, 1½, 2, 3 and 5 hp, the new line was developed for use where extra severe conditions of dirt, grit or moisture are encountered. It is also offered in explosion proof and dust-explosion proof construction for installation in hazardous locations.

Motors have cast aluminum squirrel-cage rotors and are equipped with long-life ball bearings which will run for years without attention. Except for the 5-hp size, which uses 230 v only, the new motors operate on 115/230-volt, 60 cycle power supply.

Check No. 4 on Reply Card for more Details

Stress Relieving Oven

Announcement is made by Grieve-Hendry Co. Inc., 1101 N. Paulina St., Chicago 22, Ill., of a portable electric oven model HT for processing at higher temperatures such as required for stress relief of springs and plated parts. Construction permits the nesting of one oven on top of another. They can be used in groups or banks and can be operated individually or selected ovens in the group can be

cut out or heated at different temperatures.

Temperature range is 100 to 800° F. Construction is heavy gage steel with Fiberglas insulation. No special wiring is required as oven operates from any 110 v outlet. Inside dimensions are 22 inches wide by 18 inches deep by 16 inches high.

Check No. 5 on Reply Card for more Details

Divided Platform for Truck

A low-lift platform-type power truck with platform built in two sections is a development of Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 3, O. Designed to meet special requirements as well as serving as an ordinary platform truck in handling standard skids and tote boxes, the truck has a divided forward trail axle with each of two

IT'S ALL 'IN THE HEAD'

which is a Ⓑ Special!

The heads of these special bolts have a built-in determination to resist rotation within the molded rubber product encasing them. This extra holding power is all in the head—precision formed on our modern cold-heading machinery. Even though never seen by the customer, this bolt serves him well doing a special job of bonding the strength of steel with the resilience of rubber.

THIS Ⓑ MASSAGE CUP BOLT is typical of many molded-in-rubber applications in which the life of the product depends upon a special Ⓑ Bolt

APPLICATIONS Similar applications of rubber encased bolt heads are found in cushion mounts, automotive bumpers, vacuum cups, motor mountings, shockless suspensions and in track pads.

We have a "Special" answer

FOR EVERY "SPECIAL" PROBLEM

BUFFALO BOLT COMPANY

Division of Buffalo-Eclipse Corporation

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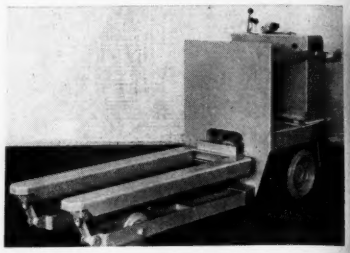
Sales Offices in Principal Cities. Export Sales Office: Buffalo International Corp., 50 Church Street, New York City

Our Specialty is "SOMETHING SPECIAL"

wheels having a separate axle mounted in its individual frame. The two parallel frames are strongly built, reinforced and welded to the truck body. Platforms are joined at their rear ends in a rigid structure, enabling them to be raised or lowered simultaneously. Forward ends are connected to the wheel frames by forged steel links and the platforms retract as they are raised.

Platforms are formed of heavy gage steel plate with deep flanges for extra strength. In lowered position the flanges come down at the



sides of the wheel frames. Platforms are 6-3/4 inches wide, 63 inches long, placed 14 inches apart. Lowered they are 10½ inches above floor and maximum height is 15 inches. These trucks are powered all-electric or gas-electric and capacities are 2000, 4000 and 6000 pounds.

Check No. 6 on Reply Card for more Details

Barrier Material Slitter

Model BL sheeter made by Miller Wrapping & Sealing Machine Co., 18 S. Clinton St., Chicago 6, Ill., provides a high speed means of slitting and cutting sheets of barrier material, particularly grade C, type I from rolls. Machine readily cuts the wrapping material although it has a tackiness caused by its waxy coating and its toughness.

A special provision prevents the tacky material from sticking to cutoff knife. Trip levers can be locked in "on" position for continuous action or manually tripped for each cut. Slitters can cut up to six sheets at a time with each knife stroke at a rate 12 to 36 cuts per minute.

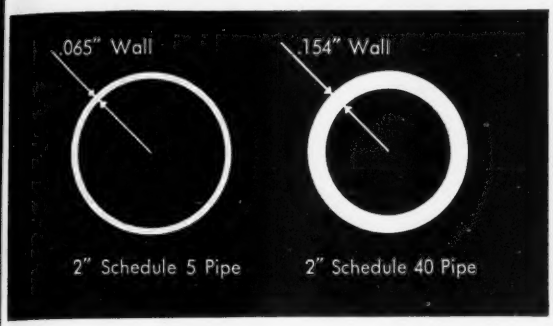
Check No. 7 on Reply Card for more Details

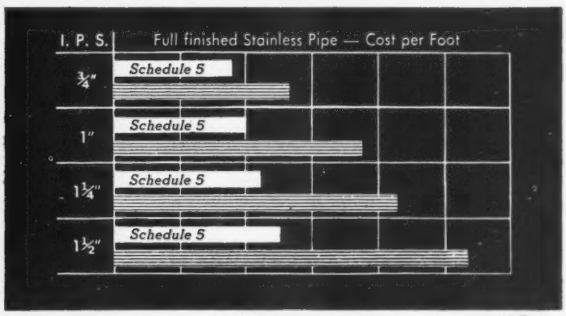
Air Pollution Detector

Thomas Autometer for detecting air pollution by sulphur dioxide, made by Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa., is available as either an integrating or nonintegrating assembly with Speedomax electronic recorder. Integrating unit continuously records actual concentration of sulphur dioxide in parts per million, records average concentration integrated over a half hour

how *Carpenter* is helping industry get more stainless pipe

—even today, when it's tough to get!





Comparison of costs with Schedule 40 shows savings of 10% to 45% with *Schedule 5*. Additional savings on costs for valves, fittings, etc. are also possible.

What Carpenter *Schedule 5* Pipe Is—

Its LIGHT WALL gives *more feet of pipe* for every pound of Stainless Steel. Cost is 40% to 50% lower. Larger I.D. increases flow area and permits use of a smaller pipe size.

You now have a way to help us improve the availability of Stainless Pipe for essential uses. And you can do it at a terrific saving in your costs.

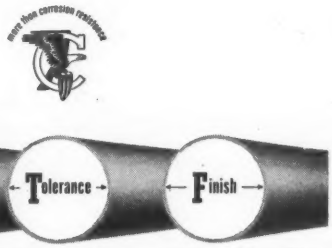
You can hook up *Schedule 5* Pipe with existing lines of tubing or heavier wall pipe, Schedules 10 and 40.

For most jobs Carpenter *Schedule 5* Stainless Pipe handles the working pressures with a good margin of safety. Any working pressure up to 150 psi is handled by this pipe. In pipe sizes under 1½", higher pressures are frequently used.

More Stainless Pipe for essential uses is possible, even under today's conditions. To get the full story, call your nearest Carpenter Stainless Tubing Distributor. Or, write for a copy of the new "*Schedule 5* Data Sheets". We will be glad to send you a set.

THE CARPENTER STEEL COMPANY
Alloy Tube Division, Union, N. J.
Export Department: Carpenter Steel Co., Reading, Pa.—"CARSTEELCO"

Carpenter
STAINLESS TUBING & PIPE



• guaranteed on every shipment

TREET-ALL

the HEVI-DUTY *Multi Purpose* FURNACE for TOOL ROOM AND EXPERIMENTAL HEAT TREATING

WITH a maximum temperature of 1850° F., the TREET-ALL can easily handle your scale free hardening, carburizing, dry cyaniding and silver brazing. The alloy muffle and gasketed door form a tight seal which simplifies atmosphere control. For hardening, an atmosphere generator is not necessary; raw gases, such as bottled or natural gas, can be used to provide the atmosphere. The furnace, quench tank, cabinet and controls form a compact, completely wired unit.

TREET-ALL furnaces are built in 3.6 KW and 8 KW sizes with inside muffle dimensions of 7" W x 15" L x 4-7/8" H and 10" W x 18" L x 7½" H respectively.

Write for Bulletin HD-1147-BB

HEVI DUTY ELECTRIC COMPANY

HEAT TREATING FURNACES HEVI-DUTY ELECTRIC EXCLUSIVELY
DRY TYPE TRANSFORMERS — CONSTANT CURRENT REGULATORS

MILWAUKEE 1, WISCONSIN

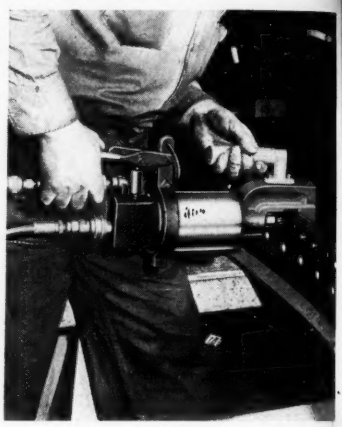
period, automatically checks its zero reading every 30 minutes and marks off each cubic foot of air sampled. The nonintegrating assembly is of simpler design providing only continuous concentration record.

Range of the equipment, 0 to 1 parts of SO_2 per million, covers concentrations which are of interest in pollution surveys. Changes in concentration as small as a few tenths of a part per million can be readily detected.

Check No. 8 on Reply Card for more Details

Hydraulic Pressure Riveter

Manco Mfg. Co., Bradley, Ill., has developed a unit called the Guillotine Riveteer for driving rivets with hydraulic pressure. A squeezing action is utilized rather than the customary hammering of the rivet head. The unit delivers 60,000 pounds thrust through the hydraulic ram and will drive 5/8-inch cold rivets. Entire



riveting cycle on the portable unit takes 2½ seconds. Operator presses the hand valve to actuate the ram; release of the valve provides automatic retraction.

Full thrust is delivered over the entire stroke and no adjustment is needed between different length rivets. Unit is also relatively quiet in operation. Little or no maintenance is required and specially designed oil seals prevent leakage both at maximum pressure and at no pressure. Companies desiring to design their own C frame may obtain the unit without the frame.

Check No. 9 on Reply Card for more Details

Dual-Channel Oscilloscope

Model H-23 dual-channel oscilloscope announced by Electronic Tube Corp., Philadelphia 18, Pa., features a flat frequency response from direct current to 1 megacycle. Use of two independent channels working into a single two-gun cathode ray tube permits high or low frequency phenom-

QUALITY
ALL THE WAY THROUGH

WEIRITE — HOT-DIP AND ELECTROLYTIC TIN PLATE, TIN MILL BLACK PLATE

WEIRZIN — ELECTROLYTIC ZINC-COATED SHEETS AND STRIP

WEIRTON — HIGH-CARBON STRIP; COLD-ROLLED SPRING STEEL

WEIRALEAD — LEAD ALLOY COATED SHEETS AND LONG TERNE SHEETS

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N-A-X — HIGH-TENSILE LOW-ALLOY STEELS

Lacquered and Coated Products • Tie Plates • Structurals • Bars • Piling
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WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION

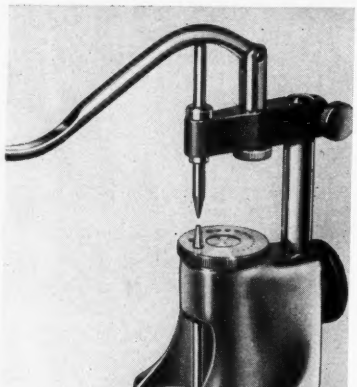
ena to be viewed either singly or simultaneously on a single tube face.

Vertical deflection amplifiers have capacitive and conductive input attenuators allowing operation as either ac or dc coupled amplifiers. Each channel is supplied with an independently operating sweep generator. Both channels may be switched to the same sweep, allowing the examination of two related phenomena on a common time base. Sweep generators are designed for either single sweep or recurrent operation.

Check No. 10 on Reply Card for more Details

Press for Light Work

Micro press is the first of a line of tools for instrument and small parts production announced by Metalix Mfg. Co., 26 Fitch St., Norwalk, Conn. It is a small, versatile press for light duty precision operation in



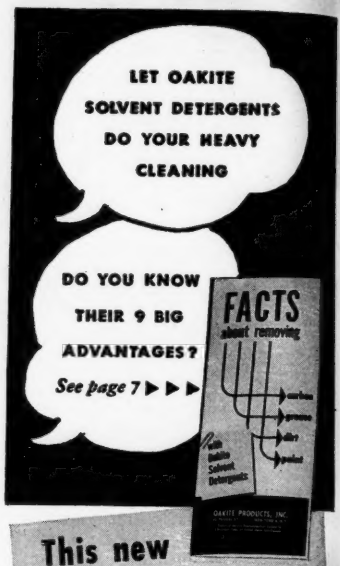
staking, punching, piercing, reaming, broaching, marking, forming and riveting. Tools are guided by an adjustable cross arm mounted on a tool steel column.

Standard adjustable fixture plate mounted on the base is hardened and lapped for accuracy, and contains 21 holes ranging from 0.013 to 0.185-inch in diameter. Clearance between the fixture plate and cross arm is adjustable up to 1 1/4 inches. Standard models are provided with a hand press lever. A special model with micrometer step depth adjustment is also offered.

Check No. 11 on Reply Card for more Details

Accurate Trailer Spotting

A motorized tractor that automatically engages various type of industrial trailers permitting operation in narrow aisles and accurate spotting of loaded trailers is announced by


LET OAKITE SOLVENT DETERGENTS DO YOUR HEAVY CLEANING
DO YOU KNOW THEIR 9 BIG ADVANTAGES?
See page 7 ▶ ▶ ▶
FACTS about removing
With Oakite Solvent Detergents
OAKITE PRODUCTS, INC.

This new FREE booklet on Solvent Detergents

TELLS HOW two new types of Oakite-developed cleaners make it easier and cheaper for you to do many difficult metal-cleaning jobs. Here are some of the subjects covered in the booklet:

- **Cleaning-action of solvent-detergents**
- **Types of Oakite solvent detergents**
- **Cleaning metal between processing operations**
- **Precleaning before painting or plating**
- **Stripping paint**
- **Providing temporary protection against rust**
- **How to use Oakite solvent-detergents:**
  - **Spray-washing machine method**
  - **Soak-tank method**
  - **Spray-rinse method**
  - **Manual method**

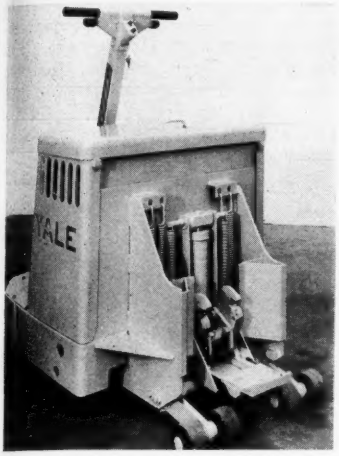
FREE For a copy of this 24-page booklet (illustrated with photographs and diagrams), write Oakite Products, Inc., 34E Thames St., New York 6, N. Y.

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS • METHODS • SERVICE

Technical Service Representatives Located in Principal Cities of United States and Canada

the Philadelphia Division, Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa. In actual operation on a large trailer it is possible to engage the end of a caster-type trailer and make a right angle turn with the center of the turn being the fixed axle of the trailer. This gives the shortest steering radius possible with a given trailer.

In operation the Grip-Tow is driven to the end of the trailer and a push-button is pressed engaging a hook on



the tractor with the lower side of the trailer frame. The hook then pulls the trailer into intimate contact with the tractor. Next, a pair of secondary hooks reach out and grab the top part of the trailer from engaging tractor and trailer. Finally, the trailing wheels of the tractor lift off the floor so that the weight of the rear end of the tractor is supported on the trailer and both form an integral unit. This is all accomplished in a few seconds providing a powered trailer with high maneuverability.

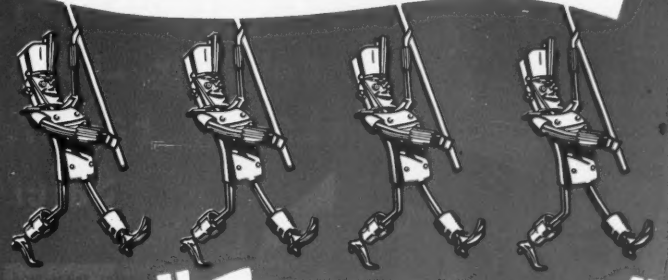
Check No. 12 on Reply Card for more Details

Work Moves Quickly

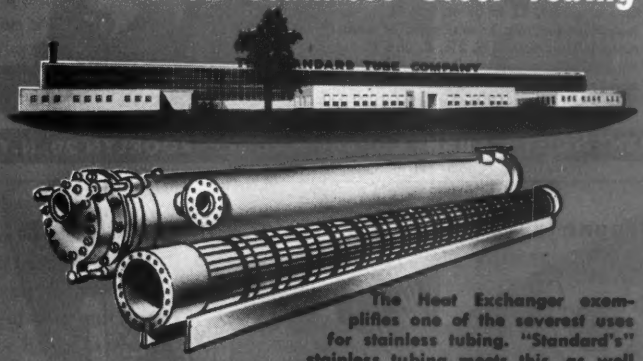
A Transfer-matic to produce exhaust manifolds has been developed by Cross Co., Detroit 7, Mich. One operator is required to process 130 pieces per hour at 100 per cent efficiency. Operations include milling the joint face, the hot-spot pad and the tailpipe pad; drilling, reaming, chamfering and tapping all holes; and boring the tailpipe hole.

Machine is made up of ten stations including one for loading; four for milling; four for drilling, reaming and boring; and one for tapping. Pieces are carried on a palletized workholding fixture which securely hold the parts between stations and

Keep in Step with—
RIGID GOVERNMENT TUBING REQUIREMENTS



SPECIFY "Standard"
for Welded Stainless Steel Tubing



The Heat Exchanger exemplifies one of the severest uses for stainless tubing. "Standard's" stainless tubing meets this, as well as many other different requirements for strength, and heat and corrosion resistance.

Deal with the Specialist among Specialists

A tubing specialist, like other specialists, knows his trade best.

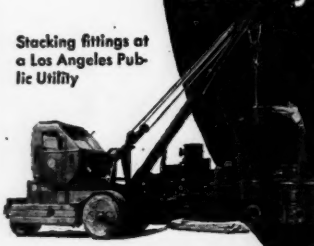
When you deal with "Standard" you deal with a tubing specialist who manufactures millions of feet of tubing every month from stainless and carbon steel—and for 25 years has been serving all types of industry for mechanical and pressure tubing applications.

If you need stainless tubing, be sure you specify "Standard". It pays to deal with the tubing specialist among specialists.

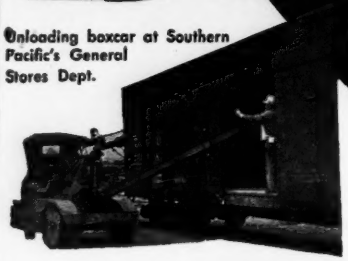
Stainless Tubing Size and Thickness
⅜" O.D. to 3" O.D.
.028 to .095 wall
Carbon Steel Tubing
½" O.D. to 5½" O.D.
.028 to .260 wall

Heavy Industries Use
KRANE KAR
SWING-BOOM MOBILE CRANE
to Cut Costs by Handling Loads Easier, Faster, Safer

Stacking fittings at a Los Angeles Public Utility



Unloading boxcar at Southern Pacific's General Stores Dept.



Handles tubes and heavy equipment at the Wilmington Refinery of the Union Oil Company

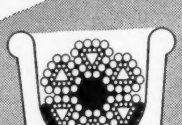
Gas or diesel, 12 to 37 ft. booms, or adjustable telescopic booms; solid or pneumatic rubber tires. 1½, 2½, 5, and 10 ton cap. Buckets, magnets, all-weather or foldable tops, and other accessories available.

WRITE FOR BULLETIN NO. 79

SILENT HOIST & CRANE CO. 849 63rd ST., BROOKLYN 20, N.Y.

ROUND STRAND

FLATTENED STRAND



SPECIFY STRONGER SAFER "HERCULES" FLATTENED STRAND

- 10% extra strength.
- Larger metallic area.
- Smooth wearing.
- Smooth running.
- Easier to rig.
- Extra safety
- Extra economy.
- RED-STRAND quality

SPREADS THE LOAD FOUR WAYS

"Hercules" Flattened Strand design spreads wear over four wires — not just one. This compact outer surface greatly reduces wear in grooves . . . helps keep them smooth. Triangular cross-section of strands permits smaller core, larger contact area between strands, and greater resistance to crushing. "Hercules" Flattened Strand Wire Rope offers greater strength and economy.

LESCHEN WIRE ROPE

Consult our Engineering Department for specific recommendations. A. LESCHEN & SONS ROPE CO., 5909 Kennerly Ave., St. Louis 12, Missouri. Distributors in all principal cities.

during all operations. Manifolds are clamped in the fixtures by means of a hydraulic power wrench. They are automatically returned from the last machining station to the loading station.

Check No. 13 on Reply Card for more Details

Accurate Measurements

Accurate measurements to a tolerance of 0.00002-inch are claimed for the Carson-Dice electronic micrometer made by the J. W. Dice Co., Englewood, N. J. An electronic circuit used in conjunction with an accurate micrometer head permits pressureless measurement and eliminates feel as a source of error. The electronic circuit is sufficiently sensitive to give

a positive on and off indication with only five millionths of an inch displacement at the contact. Several models are available with different work capacities for measurement on compressible or noncompressible materials either conducting or nonconducting in nature.

Micrometer can be used for measurement of machined parts, ball bearings, small assemblies and depths of counterbore. It can also be used to measure deflections in diaphragms, bimetal elements, spring bellows, and similar applications.

Check No. 14 on Reply Card for more Details

Lightweight Welder

Precision Welder Mfg. Co., 660 W. Grand Ave., Chicago, Ill., is adding a welder to its Shop-King line. Model 25A features six heat stages, has 20 to 100 amperes output, welds metals 24 gage to $\frac{3}{16}$-inch thick, and handles rods $\frac{1}{16}$ to $\frac{1}{8}$-inch. The unit is easy to move and is intended for light production, maintenance and repair welding.

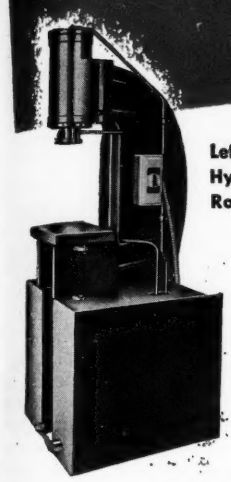
Check No. 15 on Reply Card for more Details

Testing Amplifier

Sierra laboratory carrier amplifier available from Electronic Engineering Associates Ltd., 1070 Brittan Ave., San Carlos, Calif., is designed

This MEEHANITE Ram Cylinder is...

"GUARANTEED AGAINST FAILURE"



Left—Ross & Company 20 Ton Hydraulic Press for Shop—Tool Room or Production Line

Right—The double acting Meehanite Ram Cylinder, honed to a mirror finish, is the heart of the hydraulic pump system.

Ross & Company, Chicago, Illinois, manufacturers of the 20-ton hydraulic press illustrated, fully guarantee their product "against failure due to workmanship or *material* for six months after date of sale." As an important component of this unit they specify only Meehanite cylinders which must be honed to a mirror finish. The versatility and accuracy of the action of the hydraulic pump is largely dependent upon the cylinder and its flawless, long wearing surface.

Only through rigid control of the metal structure can the needed engineering characteristics for a part of this type be obtained regularly and consistently. The Meehanite production processes provide these controls with the result that to designers, engineers and production executives throughout industry, Meehanite castings are synonymous with better properties, uniformity, dependability:—in a simple word QUALITY.

Write for our 25th Anniversary booklet "25 Years of Proof in Service."

25th Anniversary
METAL
1926-1951

MEEHANITE®

NEW ROCHELLE, N. Y.

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American Brake Shoe Co.	Mahwah, New Jersey
The American Laundry Machinery Co.	Rochester, New York
Atlas Foundry Co.	Detroit, Michigan
Banner Iron Works	St. Louis, Missouri
Barnett Foundry & Machine Co.	Irvington, New Jersey
E. W. Bliss Co.	Hastings, Mich. and Canton, O.
Builders Iron Foundry	Providence, Rhode Island
Continental Gin Co.	Birmingham, Alabama
Crawford & Doherty Foundry Co.	Portland, Oregon
The Cooper-Bessemer Corp.	Mt. Vernon, Ohio and Grove City, Pa.
Empire Pattern & Foundry Co.	Tulsa, Oklahoma
Farrel-Birmingham Co., Inc.	Ansonia, Connecticut
Florence Pipe Foundry & Machine Co.	Florence, New Jersey
Fulton Foundry & Machine Co., Inc.	Cleveland, Ohio
General Foundry & Manufacturing Co.	Flint, Michigan
Greenlee Foundry Co.	Chicago, Illinois
The Hamilton Foundry & Machine Co.	Hamilton, Ohio
Hardinge Company, Inc.	New York, New York
Hardinge Manufacturing Co.	York, Pennsylvania
Johnstone Foundries, Inc.	Grove City, Pennsylvania
Kanawha Manufacturing Co.	Charleston, West Virginia
Lincoln Foundry Corp.	Los Angeles, California
E. Long Ltd.	Orillia, Ontario
Otis Elevator Co., Ltd.	Hamilton, Ontario
The Henry Perkins Co.	Bridgewater, Massachusetts
Pohlman Foundry Co., Inc.	Buffalo, New York
Rosedale Foundry & Machine Co.	Pittsburgh, Pennsylvania
Ross-Meehan Foundries	Chattanooga, Tennessee
Shenango-Penn Mold Co.	Dover, Ohio
Standard Foundry Co.	Worcester, Massachusetts
The Stearns-Roger Manufacturing Co.	Denver, Colorado
Traylor Engineering & Mfg. Co.	Allentown, Pennsylvania
Valley Iron Works, Inc.	St. Paul, Minnesota
Vulcan Foundry Co.	Oakland, California
Warren Foundry & Pipe Corporation	Phillipsburg, New Jersey

"This advertisement sponsored by foundries listed above."

for making low level measurements from transducers of stress, strain, displacement, pressure, temperature, velocity, acceleration, and other parameters. High gain characteristics are combined with low noise. Operating stability is achieved under adverse conditions of local electrical disturbances as well as temperature and humidity variations.

Equipment is housed in units which can be either mounted in standard 19-inch racks or bench-stacked. One power supply will energize one or two 2-channel bandpass amplifiers. To facilitate stress measurements, a special network provides readings from 120-ohm strain gages with calibration directly in terms of steel stress.

Check No. 16 on Reply Card for more Details

Toggle Clamp

Clamp No. 132-A, made by Wolverine Tool Co., Detroit 7, Mich., is a large push type toggle clamp for larger, heavier fixtures. It has a plunger 1 inch in diameter with a 2½-inch stroke; ultimate load is 10,000 pounds.

Check No. 17 on Reply Card for more Details

Prevents Dock Board Slippage

Magline Inc., Pinconning, Mich., offers a new drop lock for their line of dock board and ramp combinations. It is incorporated in the ramp section of the unit and automatically drops into place against the dock, securely holding the unit in position during loading operations.

Check No. 18 on Reply Card for more Details

Improved Precision Bed Turret

Improvements in the heavy duty Newton precision bed turret are announced by A. K. Tool Co., Los Angeles 39, Calif. Models are designed to fit 10 and 11-inch Logan lathes, 10-inch Powr-Kraft, 10-inch Atlas and 12-inch Craftsman lathes. All-steel turret head accommodates six tool positions and is self-indexing.

Check No. 19 on Reply Card for more Details

Safety Pliers

Designated as OG-1-DR3, the new safety pliers announced by Osborn Mfg. Co., Warsaw, Ind., feature round jaws to facilitate gripping parts at the side. It flattens instead of shatters the object caught in a closing die.

Check No. 20 on Reply Card for more Details

Pneumatic Control Instrument

An electronic potentiometer that has a 10 per cent proportional band, a 150 per cent proportional band and manual reset, or a 150 per cent proportional band and automatic reset has been developed by Brown Instruments Division, Minneapolis-Honeywell Regulator Co., Philadelphia, Pa. It combines advantages of pneumatic control and a full 120-foot long, 11-inch calibrated width chart.

Check No. 21 on Reply Card for more Details

Air Vibrator

Type AC (air cushioned), a new type noiseless air vibrator developed by Cleveland Vibrator Co., Cleveland, O., is suited for applications where air vibration is used at close proximity to employees and where noise is a major factor. Reciprocating action of a hard chrome-plated piston develops the vibrating action. This action is noiseless because the momentum set up by the piston is cushioned by a pocket of air at each end of the vibrator assembly.

Check No. 22 on Reply Card for more Details

Magnetic Starter

An in-between capacity size magnetic starter is introduced by Furnas Electric Co., Batavia, Ill. It is rated at 10 hp, 220-550 v, three phase, ac. It has renewable, rectangular type contacts of specially developed silver for maximum arc quenching properties and lowest contact resistance.

Check No. 23 on Reply Card for more Details

Paper Reproduces Blueprint

Kodagraph Repro-Negative paper, introduced by Eastman Kodak Co., Rochester 4, N. Y., is a new photographic reproduction paper that produces black-on-white photographic intermediates directly from blueprints and other negative originals without need for darkroom handling or special equipment.

Check No. 24 on Reply Card for more Details

Neox-Coated Rubber Gloves

A new type of rubber glove coated with Neox is offered by Hanson-Van Winkle-Munning Co., Matawan, N. J., for plating room use. The Neox coating is chemically welded to strong fabric. Seams are tight and safe against harmful fluids. Gloves are available in 14 and 18-inch elbow length gauntlet.

Check No. 25 on Reply Card for more Details

Automatic Ring Packing

Designated as Uneepac, a new automatic ring packing is announced by Johns-Manville, New York 16, N. Y. It is a molded packing and each ring is a complete, self-contained packing unit. It is designed for maximum sealing efficiency in minimum packing depth so stuffing box sizes can be reduced. No follower or header rings are needed. The packing is offered in varied compositions to suit different services. It is furnished in sets of endless or split rings and is available for shafts ⅝-inch diameter and up.

Check No. 26 on Reply Card for more Details

Attenuator Switch

Shallcross Mfg. Co., Collingdale, Pa., offers a line of attenuator switches that includes 12 round, single-deck units in one and two-pole types with up to 60 contact positions and with rotations ranging from 144 to 360 degrees. Switches are obtainable with or without detent mechanism.

Check No. 27 on Reply Card for more Details

Power Attachment for Positione

Newly designed power attachment for their balanced positioners are offered by Aronson Machine Co., Arcade, N. Y. Features of the unit are infinitely variable speeds from 0 to 6 rpm, quick engage and disengage of the power transmission for use of power rotation or manual rotation and positioning, worm and worm gear final drive adjustable to virtually eliminate backlash on the work table. Friction clutch coupling allows the operator to position workpiece on the rotational axis whether table is turning or not.

Check No. 28 on Reply Card for more Details

Air Grinder

A new air grinder, announced by Ingersoll-Rand Co., Phillipsburg, N. J., has an added safety device to prevent overspeed operation. It contains a motor governor to maintain correct wheel speed, plus a built-in unit called the overspeed safety coupling. In case motor overspeeds because of governor wear, abuse, maladjustment or dirty air, this safety coupling automatically uncouples the arbor and grinding wheel from the motor. Grinder is available for 8, 6 or 5-inch wheels running at respective motor speeds of 3100, 4100 and 4500 rpm.

Check No. 29 on Reply Card for more Details

FOR MORE INFORMATION

on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Helpful Literature

73. Tool Steels

Raven Steel & Tool Co., American agents for Bohler Bros. & Co., Ltd. of Austria—Technical folder entitled "Bohler Summary of Standard Tool Steels" opens up into 17 x 7½-in. chart which tabulates class, composition, temperature, hardness and application data for standard grades of tool steels.

74. Metal Cleaner

Oakite Products, Inc.—How Oakite compound No. 33 metal cleaner removes oil and rust and conditions metal for good paint adhesion is described in 6-page booklet. Compound removes oils, rust preventives, carbon smuts, fluxes, identification inks, rust, heat scale, tarnish and other oxides.

75. Forced Draft Fans

Thermix Corp.—8-page illustrated bulletin 300 describes such features of forced draft fans as high static efficiency, over-sized housings, deep inlet cones and wide space between wheels on double wheel models. Various types of housings and various types of fan-wheels are covered.

76. Metal Stampings

Leake Stamping Co.—Loose-leaf catalog "Metal Stampings" contains reprints of 20 data sheets which describe typical stampings produced to customer specifications, production facilities and design services offered by company.

77. Mobile Crane

R. G. LeTourneau Inc.—Specifications of the model EC Tournacrane for use with model D Roadster Tournapull are given in 4-page illustrated bulletin. This mobile crane unit has maximum capacity of 7 tons, maximum lift of 29¼ ft and maximum reach of 31 ft.

78. Roller and Conveyor Chain

Whitney Chain Co.—Catalog HD-51 offers simple and quick means of determining interchangeability of various makes of roller and conveyor chains. Additional information aids in determining proper application of chain drives as a power transmission or conveying medium.

79. Insulating Laminate

Richardson Co.—Data sheet No. 20.812.1 describes grade T-812 Insurok insulating laminate which has high electrical resistance, low moisture absorption and high strength.

80. Generator-Battery Charger

Electric Products Co.—4-page illustrated bulletin 11-220 describes self-contained, fully automatic four-circuit motor generator battery charger. Unit controls charging current at rates prescribed by battery manufacturer, cutting off each battery when fully charged, then turning itself off.

81. Chip Conveyor

May-Fran Engineering, Inc.—Described in data sheet is the Chip-Tote conveyor that will continuously remove wet or dry chips, borings and turnings from high production machine tools. Illustrations show conveyor in operation.

82. Boring, Drilling Machine

Portage Machine Co. — 12-page catalog illustrates and explains mechanical characteristics, construction and operating details of horizontal boring, drilling and milling machines having large dials for reading to 0.001-in. Details on vertical and horizontal attachments and microscopic-read scale are included.

83. Aluminum

Reynolds Metals Co.—"The A-B-C's of Aluminum" is title of 100-page booklet presenting a comprehensive story of the mining, processing and fabricating of aluminum metals. Pictures show production of metal into sheet, rod and bar forms as well as typical welding, forming and other fabricating operations.

84. Precision Drill Press

Hamilton Tool Co.—4-page illustrated bulletin MJ-47 lists specifications of supersensitive drilling machines which have capacities of 0.004 to 5/16-in. in all drilling materials. Spindle speeds from 1500 to 8750 rpm are available with standard drives.

85. Fire Extinguishing Foam

National Foam System, Inc.—How Aer-O-Foam 99 liquid type mechanical foam extinguishes polar solvent or petroleum product fires is described in 4-page illustrated bulletin 500A. Foam offers protection when applied to methyl, ethyl and isopropyl alcohol; ester, ketone and ether-fed fires.

86. Socket Screws

Holo-Krome Screw Corp.—Complete line of button head socket cap screws and detailed engineering data are featured in 28-page catalog 51 as well as information on all of company's cold forged products. Additional data on H-K dowel pins, socket screw keys and key sets is given.

FOR MORE INFORMATION USE ONE OF THESE CARDS . . .

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(Sec. 34.9 P.L.&R.)
Cleveland, Ohio

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CLEVELAND 13, OHIO

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7	27	47	67	87
8	28	48	68	88
9	29	49	69	89
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14	34	54	74	94
15	35	55	75	95
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COMPANY

PRODUCTS MANUFACTURED

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CITY and ZONE STATE

This card MUST be completely filled in. Please TYPE or PRINT

HELPFUL LITERATURE

87. Aluminum Etching Compound

Diversey Corp.—Aluminux alkaline etching compound for all aluminum alloys is described in 4-page illustrated bulletin No. 51 A. Compound offers uniform etched surface with diffused reflection, provides method of control to determine bath life and eliminates scale formations on tank and coils.

88. Tool Steel Selector

Crucible Steel Co. of America—Designed on basis that application dictates choice of tool steel is a circular selector which covers 22 tool steels, all standard warehouse steels. To use, it is only necessary that type and condition of material to be worked, number of pieces to be produced, method of working and condition of equipment to be used be known.

89. Refractory Cement

Harbison-Walker Refractories Co.—Vega Bond silica cement used for laying silica refractories and for poured or trammeled joints is subject of 4-page technical bulletin. Cement will not soften at 3000° F. Photos show effects of heat treatment, refractoriness, trowelling and settling.

90 Tap Catalog

DoALL Co. — Illustrations and specifications on hand, machine screw, nut, pulley, pipe, tapper, hook and special taps are included in 16-page catalog No. 51-813. Also included are nine pages of technical data and ordering information.

91. Fastener Production

Tinnerman Products, Inc.—20-page booklet No. 315 gives descriptive and illustrated outline of company's history and production facilities. Testing, analyzing and precision methods are emphasized.

92. Precision Metal Parts

Geometric Stamping Co.—16-page illustrated booklet "Geometric Craftsmanship" outlines services company renders in supplying precision stamped metal parts, welded subassemblies of parts and complete products.

93. Welding Plugs

Joy Mfg. Co.—Push-lock type plugs for portable feeder cables to welding machines are illustrated and described in data sheet No. SM-2. Specially designed for welding needs, plugs are easily engaged yet are almost impossible to disconnect accidentally.

94. Sheet Metal Fabricating

Hoeltge Bros. Inc.—4-page illustrated folder discusses sheet metal fabrication service of company from drafting board to finished product. Variety of sheet metal products made to customer specifications are shown and list of machines and capacities is given.

95. Copper's Characteristics

American Brass Co.—Explanation of chemical and physical nature of corrosive attack on copper and copper alloys is found in 24-page illustrated booklet B-36 "Corrosion Resistance of Copper and Copper Alloys." Included is tabulation showing relative corrosion resistance of principal types of copper and copper base alloys when in contact with 18 different corroding agents.

96. Oil Filters

General Filters, Inc.—File folder containing three data sheets covers AF-500 series of filters for hydraulic and lubricating oils, hydrocarbon liquids, paints and varnishes; 1300 series filters for hydraulic and lubricating oils, and portable model AF-2000 applicable to same materials as AF-500 series.

97. Nickel Cast Irons

International Nickel Co.—28-page reference bulletin, compiled for design engineers, presents characteristics of nickel cast irons. Fifty illustrations indicate industrial usage. Twenty-seven tables, charts and photomicrographs show how nickel alone or with alloying elements allows cast iron to meet almost any reasonable combination of service requirements.

98. Cork Products

Dodge Cork Co.—4-page illustrated bulletin "Dodge Industrial Cork Products" presents characteristics and uses for cork compositions and natural cork along with tables giving physical properties of both types. Sheet sizes, equivalents of government specifications for cork compositions and standard taper cork sizes are included.

99. Molybdenum Steels

Climax Molybdenum Co.—This 36-page booklet "Molybdenum High Speed Steels" includes general facts on this type of steel, historical background, plus detailed information on compositions, applications, advantages, cutting properties, forging, protective coatings, annealing and heat treatment of M2 and Mo-Max types.

100. Metal Cleaning

DuBois Co.—Intended to help metal fabricators and finishers in choice and use of metal cleaning compounds for industrial washer use is this 6-page booklet. Information on types of compounds used in alkaline, emulsion and acid aqueous systems, is included.

FOR MORE INFORMATION USE ONE OF THESE CARDS . . .

STEEL Numbers

1	21	41	61	81
2	22	42	62	82
3	23	43	63	83
4	24	44	64	84
5	25	45	65	85
6	26	46	66	86
7	27	47	67	87
8	28	48	68	88
9	29	49	69	89
10	30	50	70	90
11	31	51	71	91
12	32	52	72	92
13	33	53	73	93
14	34	54	74	94
15	35	55	75	95
16	36	56	76	96
17	37	57	77	97
18	38	58	78	98
19	39	59	79	99
20	40	60	80	100

STEEL 9-10-51
Penton Building, Cleveland 13, Ohio

Please send ☐ Literature ☐ Price Information ☐ Nearest source of supply on the items circled at the left.

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Readers' Service Dept.

Here, Alco welders help meet production schedules on locomotive frames, vital to defense, by using G-E a-c welders. AC welders eliminate troublesome arc-blow encountered when welding high-tensile steels with d-c equipment.

100% A-C WELDED!

Here's How Alco Produces Road Locomotive Frames with G-E Welders

Shown above are two of the many G-E a-c welders used at Alco.

Corners can be difficult to weld, but the absence of troublesome arc-blow with G-E a-c welders enables this operator to lay an even corner bead in any position.

Diesel-electric road locomotive frames are 100% a-c welded at the Schenectady, N. Y., plant of American Locomotive Company. Alco welding engineers report that General Electric a-c welders eliminate troublesome arc-blow, make for easy striking, cost less than d-c, use less power and are easily maintained.

Like the American Locomotive Company, you may also find that you can speed production by using G-E a-c welders. For example . . .

YOU CAN WELD BETTER WITH AC

You have complete control of the arc in all positions because G-E a-c welders eliminate troublesome arc-blow. This reduces the danger of undercutting and slag inclusions and produces better welds.

YOU CAN WELD FASTER WITH AC

In almost every case you can use higher currents and larger electrodes. That means more footage. Users report increases of 10 to 50%.

YOU CAN WELD AT LOWER COST WITH AC

G-E a-c welders cost less than d-c equipment of the same rating. They use only one-fourth as much power when idling and have much lower load losses. And because there are no rotating parts, maintenance is practically negligible.

SEE YOUR G-E WELDING DISTRIBUTOR!

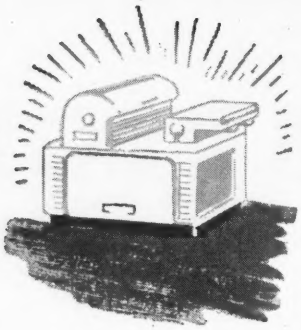
He's listed in the yellow pages of the telephone directory. Just look for General Electric under "Welding Equipment." Your distributor carries a complete line of welders, accessories and electrodes. General Electric, Schenectady 5, N. Y.

GENERAL ELECTRIC

711-17

This man...

HELPS YOU IMPROVE YOUR PRODUCT!



New materials and better manufacturing methods contribute improvement to a product no less than new and better design. How can the manufacturer know when there is something new that applies particularly to his product or operation?

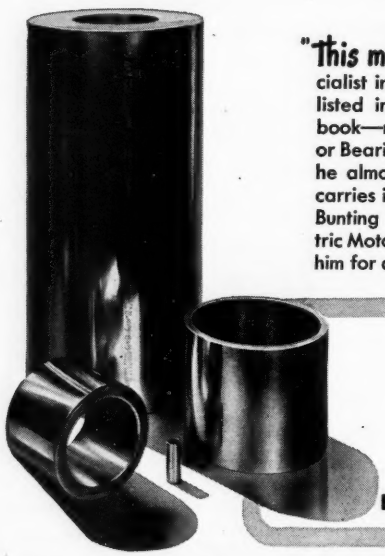
Just leave the door open and a man will call to tell all about the new things—machines, materials and methods—in modern manufacturing. Often he will bring to your attention something that is "right up your alley". It is his business to know, and he is constantly on the lookout for new things you can use.

If you don't want to wait for his call, phone him.

Responsible

"This man" is an industrial distributor or a specialist in certain industrial items. You will find him listed in the classified section of your telephone book—most likely under the heading Bars, bronze or Bearings, bronze. If he is the leading distributor, he almost certainly is the Bunting Distributor. He carries in stock for your money saving convenience Bunting Standard Stock Industrial Bearings, Electric Motor Bearings, and Precision Bronze Bars—ask him for catalog.

There are approximately 2000 Industrial Distributors serving every industrial section of the United States. In 1948 their total sales were more than $3,000,000,000. They carry an average inventory of $500,000,000, turn their stocks 5 to 6 times per year, fill 200,000 orders per day, have 12,000 outside salesmen and engineers, 10,000 inside telephone order expeditors, operate 8000 trucks delivering merchandise on which their average net profit is .0292 cents per dollar of sales.



Bunting®

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THE BUNTING BRASS & BRONZE CO., TOLEDO 9, OHIO

The Market Outlook

SHIFT in steel demand from peacetime to defense consumption is accelerating. Some classes of consumers, specifically consumer durable goods, are pressing less vigorously for tonnage in the face of sluggish demand for their finished goods. On the other hand, manufacturers on military and related account are seeking increasingly larger tonnage. Net effect is overall demand on the steel mills and warehouses is as strong as ever despite the soft spots in manufacturing, some of which are attributable to government limitations on use of raw materials.

ORDERING— Steelmakers report orders for shipments after the turn of the year are mounting, some for delivery as late as third quarter. But producers are accepting little business beyond first quarter, except where special military directives are involved. Even such acceptances are limited. Indications are the mills will move cautiously in booking far ahead with fourth quarter rolling schedules not yet firmly established.

FOURTH QUARTER—As things now stand, scheduling will remain a headache for the steelmakers all through fourth quarter. Substantial CMP ticketed tonnage still remains unplaced, and its placement is dependent upon cancellations of duplicate tonnage believed to be on mill order books. This means rolling schedules will be pretty much subject to change all through the period. Recently announced allotments to various federal agencies for fourth quarter are understood to be below stated requirements in most cases. Consequently, it appears possible that in some instances, at least, allotments are actually below the tonnage placed with the mills for that position. In such case, some cancellations on these accounts can be anticipated. In any event, however, it is unlikely schedules will be much affected before Nov. 1.

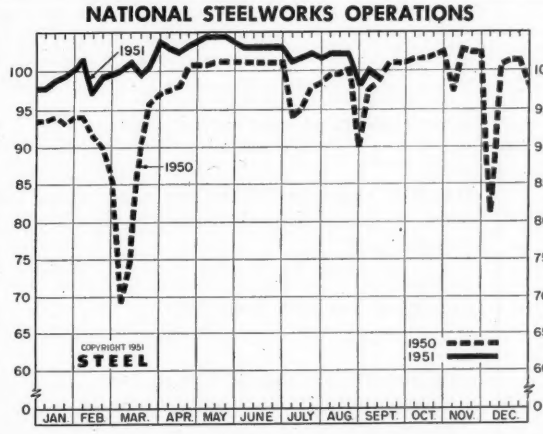
PRODUCTS— New structural steel awards are relatively light in the aggregate. Restriction of the amount of steel available in fourth quarter for industrial construction will delay considerable work, including steel expansions, and will necessitate some adjustments in fabricating shop schedules. Demand for flat-rolled products continues strong but pressure is definitely off from appliance and similar civilian goods consumers. Some of these are reported holding comfortable stocks of steel. Due to heavy arrearages, bar producers still are unable to set up fourth quarter schedules with any assurance they will stick. Consumers of basic pig iron are pressing for tonnage, but demand from the foundries is less in evidence, though strong. Some of the jobbing foundries, in a temporary lull, anticipate a fall pickup soon largely on defense and related work.

SCRAP— Increasing attention is being directed to the shortage of scrap which threatens to force curtailment of steelmaking operations this winter. Scrap drives are being pushed throughout the country. While some success is attending these efforts, the steel mills have not been able to materially enlarge their stockpiles. In almost every case it is "touch-and-go" as regards steelmaking scrap though mill operations to date have not been greatly affected. Curtailments, however, have been averted only through extensive allocation under government direction, some scrap moving from distant points to relieve sorely pressed mills. The supply situation as regards cast scrap is less serious than in steelmaking grades.

PRODUCTION— Operations at steelworks slipped 1 points last week to 99 per cent of capacity, equivalent to production of about 1,980,000 net tons.

PRICES— Undertone of the market pricewise is firm. Except for a revision on carbon plates by an eastern producer, resulting in an increase of $36 per ton in its published price, schedules are unchanged. STEEL's weighted index on finished steel holds at 171.92.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Sept. 8	Change	Same Week 1950	Same Week 1949
Pittsburgh	98	+ 0.5	101.5	79.5
Chicago	105	+ 2*	100.5	92
Mid-Atlantic	98	— 2.5	98.5	81
Youngstown	98	— 8	103	94
Wheeling	96.5	— 1	95	92
Cleveland	100.5	— 1	94.5	99.5
Buffalo	104	0	104	98.5
Birmingham	100	0	100	100
New England	85	— 7	65	77
Cincinnati	103	+ 3*	103	95
St. Louis	81	— 6	78	87
Detroit	100	— 0*	108	92
Western	102	0	106	82
Estimated national rate	99	— 1	98.5	85

Based on weekly steelmaking capacity of 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950; 1,843,516 tons for 1949.

* Change from revised rate for preceding week.

Composite Market Averages

	Sept. 6 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)..	171.92	171.92	171.92	156.99	112.04
Index in cents per lb.	4.657	4.657	4.657	4.253	3.035
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$106.32	$106.32	$106.32	$94.50	$64.45
No. 2 Fdry, Pig Iron, GT..	52.54	52.54	52.54	46.85	28.17
Basic Pig Iron, GT	52.16	52.16	52.16	45.97	27.50
Malleable Pig Iron, GT	53.27	53.27	53.27	47.49	28.79
Steelmaking Scrap, GT ...	44.00	44.00	44.00	41.08	19.17

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Sept. 6 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.70	3.70	3.70	3.45	2.50
Bars, H.R., Chicago	3.70	3.70	3.70	3.45	2.50
Bars, H.R., del. Philadelphia	4.223	4.223	4.20	3.93	2.86
Bars, C.F., Pittsburgh	4.55	4.55	4.55	4.10–15	3.10
Shapes, Std., Pittsburgh ..	3.65	3.65	3.65	3.40	2.35
Shapes, Std., Chicago	3.65	3.65	3.65	3.40	2.35
Shapes, del. Philadelphia...	3.918	3.918	3.91	3.46	2.48
Plates, Pittsburgh	3.70	3.70	3.70	3.50	2.50
Plates, Chicago	3.70	3.70	3.70	3.50	2.50
Plates, Coatesville, Pa. ...	4.15	4.15	4.15	3.90	2.50
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.50	2.50
Plates, Claymont, Del.	4.15	4.15	4.15	3.90	2.50
Sheets, H.R., Pittsburgh...	3.60–75	3.60–75	3.60–75	3.35	2.425
Sheets, H.R., Chicago	3.60	3.60	3.60	3.35	2.425
Sheets, C.R., Pittsburgh ..	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Chicago	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Detroit	4.55	4.55	4.55	4.30	3.375
Sheets, Galv., Pittsburgh..	4.80	4.80	4.80	4.40	4.05
Strip, H.R., Pittsburgh....	3.75–4.00	3.75–4.00	3.75–4.00	3.50	2.35
Strip, H.R., Chicago	3.50	3.50	3.50	3.25	2.35
Strip, C.R., Pittsburgh ...	4.65–5.35	4.65–5.35	4.65–5.35	4.15–50	3.05
Strip, C.R., Chicago	4.90	4.90	4.90	4.30	3.15
Strip, C.R., Detroit	4.85–5.60	4.85–5.60	4.85–5.60	4.35–95	3.15
Wire, Basic, Pittsburgh....	4.85–5.10	4.85–5.10	4.85–5.10	4.50	3.05
Nails, Wire, Pittsburgh ...	5.90–6.20	5.90–6.20	5.90–6.20	5.30	3.75
Tin plate, box, Pittsburgh.	$8.70	$8.70	$8.70	$7.50	$5.25

SEMIFINISHED

Billets, forging, Pitts. (NT)	$66.00	$66.00	$66.00	$63.00	$47.00
Wire rods, $\frac{7}{32}$-$\frac{9}{16}$", Pitts. ..	4.10–30	4.10–30	4.10–30	3.85	2.30

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$47–$50	$29.00
Basic Valley	52.00	52.00	52.00	46.00	28.00
Basic, del. Phila.	56.61	56.61	56.49	50.39	29.93
No. 2 Fdry, Pitts.	52.50	52.50	52.50	49.50	28.50
No. 2 Fdry, Chicago	52.50	52.50	52.50	46.50	28.50
No. 2 Fdry, Valley	52.50	52.50	52.50	46.50	28.50
No. 2 Fdry, Del. Phila. ..	57.11	57.11	56.99	50.89	30.43
No. 2 Fdry, Birm.	48.88	48.88	48.88	42.38	24.88
No. 2 Fdry (Birm.) del. Cin.	55.49	55.49	55.33	49.08	28.94
Malleable Valley	52.50	52.50	52.50	46.50	28.50
Malleable, Chicago	52.50	52.50	52.50	46.50	28.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	60.00	33.00
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	175.00	140.00*

* Delivered, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt, Pitts. ..	$45.00	$45.00	$45.00	$44.00	$20.00
No. 1 Heavy Melt, E. Pa. .	43.50	43.50	43.50	39.25	18.75
No. 1 Heavy Melt, Chicago	43.50	43.50	43.50	40.00	18.75
No. 1 Heavy Melt, Valley..	45.00	45.00	45.00	43.75	20.00
No. 1 Heavy Melt, Cleve...	44.00	44.00	44.00	41.25	19.50
No. 1 Heavy Melt, Buffalo	44.00	44.00	44.00	39.75	19.25
Rails, Rerolling, Chicago..	52.50	52.50	52.50	59.50	22.25
No. 1 Cast, Chicago	49.00*	49.00*	49.00*	49.50	20.00

* F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn. Connlsvl. ..	$14.75	$14.75	$14.75	$14.25	$8.75
Beehive, Fdry., Connlsvl...	17.50	17.50	17.50	15.50	9.50
Oven Fdry., Chicago	23.00	23.00	23.00	21.00	14.35

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	22.50–24.50	14.375
Zinc, E. St. Louis	17.50	17.50	17.50	15.00	8.25
Lead, St. Louis	16.80	16.80	16.80	14.80	8.10
Tin, New York	103.00	103.00	103.00	99.00	52.00
Aluminum, del.	19.00	19.00	19.00	17.50	15.00
Antimony, Laredo, Tex. ..	42.00	42.00	42.00	28.50	14.50
Nickel, refinery, duty paid.	56.50	56.50	56.50	48.00	35.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$54.00	$54.50	$55.00	$55.50
Brooklyn, N.Y., del.	....	59.18	59.68	....
Newark, del.	56.87	57.37	57.87	58.37
Philadelphia, del.	56.61	57.11	57.61	58.11
Birmingham District				
Alabama City, Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward, Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	55.49	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda, N.Y. W12	52.00	52.50	53.00	....
No. Tonawanda, N.Y. T9	....	52.50	53.00	....
Boston, del.	62.11	62.61	63.11	....
Rochester, N.Y., del.	54.88†	55.38†	55.88†	....
Syracuse, N.Y., del.	55.91†	56.41†	56.91†	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary, Ind. U5	52.00	....	52.50	....
Indiana Harbor, Ind. I-2	52.00	....	52.50	....
So. Chicago, Ill. W14	52.00	52.50	52.50	....
So. Chicago, Ill. Y1	52.00	52.50	52.50	....
So. Chicago, Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	54.06	54.56	54.56	55.06
Muskegon, Mich., del.	....	58.47	58.47	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron, O., del. from Cleve.....	54.61	55.11	55.11	55.61
Lorain, O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie, Pa. I-3	52.00	52.50	52.50	53.00
Everett, Mass. E1	....	55.25	55.75	....
Fontana, Calif. K1	58.00	58.50	....	....
Geneva, Utah G1	52.00	52.50	....	....
Seattle, Tacoma, Wash., del.	....	60.66	....	....
Portland, Oreg., del.	....	60.66	....	....
Los Angeles, San Francisco, del. ..	60.16	60.66	....	....
Granite City, Ill. G4	53.90	54.40	54.90	....
St. Louis, del. (inc. tax)	54.66	55.16	55.66	....
Ironton, Utah C11	52.00	52.50	....	....
Lone Star, Tex. L6	48.00	*48.50	48.50	....
Minnequa, Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
Neville Island, Pa. P6	....	52.50	52.50	53.00
Pitts., N. & S. sides, Ambridge, Aliquippa, del.	....	53.80	53.80	54.30
McKees Rocks, del.	....	53.54	53.54	54.04
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	54.07	54.07	54.57
Verona, del.	....	54.57	54.57	55.07
Brackenridge, del.	....	54.82	54.82	55.32
Bessemer, Pa. U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa. U5	52.00	....	....	....
McKeesport, Pa. N3	52.00	....	....	53.00
Monessen, Pa. P7	54.00	....	....	....
Sharpsville, Pa. S6	....	....	52.50	53.00
Steelton, Pa. B2	54.00	54.50	55.00	55.50
Swedeland, Pa. A3	56.00	56.50	57.00	57.50
Toledo, O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.47	57.97	....	....
Troy, N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield, O., del.	56.65	57.15	57.15	57.65

* Low phos, southern grade. † Preliminary.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.
Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.
Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.
Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

Niagara Falls, N.Y. P15	$88.00
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$66.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton, Pa. B2	60.00
Philadelphia delivered	63.37
Troy, N.Y. R2	60.00

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Sept. 6, 1951; cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$79.00
Munhall,Pa. U5 .....52.00

INGOTS, Alloy (NT)
Detroit R7 .....$54.00
Fontana,Calif. K1 ....80.00
Houston,Tex. S5 .....62.00
Midland,Pa. C18 .....54.00
Munhall,Pa. U5 .....54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$56.00
Clairton,Pa. U5 .....56.00
Ensley,Ala. T2 .....56.00
Fairfield,Ala. T2 ....56.00
Fontana,Calif. K1 ....75.00
Gary,Ind. U5 .....56.00
Johnstown,Pa. B2 ....56.00
Lackawanna,N.Y. B2..56.00
Munhall,Pa. U5 .....56.00
So.Chicago,Ill. U5 ....56.00
So.Duquesne,Pa. U5 ...56.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$66.00
Buffalo R2 .....66.00
Canton,O. R2 .....66.00
Clairton,Pa. U5 .....66.00
Cleveland R2 .....66.00
Conshohocken,Pa. A3 ..73.00
Detroit R7 .....69.00
Ensley,Ala. T2 .....66.00
Fairfield,Ala. T2 ....66.00
Fontana,Calif. K1 ....85.00
Gary,Ind. U5 .....66.00
Geneva,Utah G1 .....66.00
Houston,Tex. S5 .....74.00
Johnstown,Pa. B2 ....66.00
Lackawanna,N.Y. B2 ..66.00
LosAngeles B3 .....85.00
Munhall,Pa. U5 .....66.00
Seattle B3 .....85.00
So.Chicago R2,U5,W14 .66.00
So.Duquesne,Pa. U5 ...66.00
So.SanFrancisco B3 ...85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$70.00
Buffalo R2 .....70.00
Canton,O. R2 .....70.00
Canton,O. (29) T7 ....66.00
Conshohocken,Pa. A3 ..77.00
Detroit R7 .....73.00
Fontana,Calif. K1 ....89.00
Gary,Ind. U5 .....70.00
Houston,Tex. S5 .....78.00
Ind.Harbor,Ind. Y1 ...70.00
Johnstown,Pa. B2 ....70.00
Lackawanna,N.Y. B2 ..70.00
LosAngeles B3 .....90.00
Massillon,O. R2 .....70.00
Midland,Pa. C18 .....70.00
Munhall,Pa. U5 .....70.00
So.Chicago R2,U5,W14..70.00
So.Duquesne,Pa. U5 ...70.00
Struthers,O. Y1 .....70.00
Warren,O. C17 .....70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 .....$82.00
Cleveland R2 .....82.00
Fontana,Calif. K1 ....103.00
Gary,Ind. U5 .....82.00
Massillon,O. R2 .....82.00
So.Chicago,Ill. R2 ....82.00
So.Duquesne,Pa. U5 ...82.00

SHEET BARS (NT)
Fontana,Calif. K1 ...$89.00

SKELP
Aliquippa,Pa. J5 .....$3.45
Munhall,Pa. U5 .....3.35
Warren,O. R2 .....3.35
Youngstown, R2, U5 ...3.35

WIRE RODS
Alton,Ill. L1 .....4.40
AlabamaCity,Ala. R2 ..4.10
Buffalo W12 .....4.10
Cleveland A7 .....4.10
Donora,Pa. A7 .....4.10
Fairfield,Ala. T2 ....4.10
Fontana,Calif. K1 ....4.90
Houston,Tex. S5 .....4.50
Johnstown,Pa. B2 ....4.10
Joliet,Ill. A7 .....4.10
LosAngeles B3 .....4.90
Minnequa,Colo. C10 ...4.35
Monessen,Pa. P7 .....4.30
No.Tonawanda,N.Y.B11 4.10
Pittsburg,Calif. C11 ...4.75
Portsmouth,O. P12 ....4.30
Roebling,N.J. R5 .....4.20
So. Chicago,Ill. R2 ...4.10
SparrowsPoint,Md. B2 ..4.20
Sterling,Ill.(1) N15 ...4.10
Struthers,O. Y1 .....4.10
Torrance,Calif. C11 ....4.90
Worcester,Mass. A7 ...4.40

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.45
Lackawanna,N.Y. B2 ...4.45
Munhall,Pa. U5 .....4.45
So.Chicago,Ill. U5 ....4.45

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..3.60
Aliquippa,Pa. J5 .....3.65
Bessemer,Ala. T2 .....3.65
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fairfield,Ala. T2 .....3.65
Fontana,Calif. K1 .....4.25
Gary,Ind. U5 .....3.65
Geneva,Utah G1 .....3.65
Houston,Tex. S5 .....4.05
Ind.Harbor,Ind. I-2 ....3.65
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 .....4.25
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.25
Minnequa,Colo. C10 ....4.10
Munhall,Pa. U5 .....3.65
Niles,Calif.(22) P1 ....4.85
Phoenixville,Pa. P4 .....6.25
Portland,Oreg. O4 .....4.50
Seattle B3 .....4.30
So.Chicago,Ill. U5, W14..3.65
So.SanFrancisco B3 ....4.20
Torrance,Calif. C11 ....4.25
Weirton,W.Va. W6 .....3.90

Alloy Stand. Shapes
Clairton,Pa. U5 .....4.35
Fontana,Calif. K1 .....5.55
Munhall,Pa. U5 .....4.35
So.Chicago,Ill. U5 ....4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.50
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa.(14) B2..5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana, Calif. K1 ....6.10
Gary,Ind. U5 .....5.50
Geneva,Utah G1 .....5.50
Ind.Harbor,Ind I-2 ....5.50
Ind.Harbor,Ind. Y1 ....6.00
Johnstown,Pa. B2 .....5.50
Lackawanna,N.Y.(14)B2 5.50
LosAngeles B3 .....6.05
Munhall,Pa. U5 .....5.50
Seattle B3 .....6.10
So.Chicago,Ill. U5 .....5.50
So.SanFrancisco B3 ....6.00
Struthers,O. Y1 .....6.00

Wide Flange
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fontana,Calif. K1 .....4.65
Lackawanna,N.Y. B2 ..3.70
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 ....3.65

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....5.50
Lackawanna,N.Y. B2 ...5.50
Munhall,Pa. U5 .....5.45
So.Chicago,Ill. U5 ....5.45

BEARING PILES
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 ....3.65

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.65
Bessemer,Ala., T2 .....5.65
Clairton,Pa. U5 .....5.65
Cleveland J5, R2 .....5.65
Conshohocken,Pa. A3 ..5.90
Fairfield,Ala. T2 .....5.65
Fontana,Calif.(30) K1 ..6.25
Gary,Ind. U5 .....5.65
Geneva,Utah G1 .....5.65
Ind.Harbor,Ind. I-2 ....5.65
Ind.Harbor, Ind. Y1 ....6.15
Johnstown,Pa. B2 .....5.65
Munhall,Pa. U5 .....5.65
Pittsburgh J5 .....5.65
Seattle B3 .....6.55
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 .....5.65
SparrowsPoint,Md. B2 ..5.65
Warren,O. R2 .....5.65
Youngstown, Y1 .....6.15

PLATES, Open-Hearth Alloy
Claymont,Del. C22 .....4.85
Coatesville,Pa. L7 .....5.25
Conshohocken,Pa. A3 ..5.05
Fontana,Calif. K1 .....5.70
Gary,Ind. U5 .....4.75
Johnstown,Pa. B2 .....4.75
Munhall,Pa. U5 .....4.75
Sharon,Pa. S3 .....5.20
So.Chicago,Ill. U5 .....4.75
SparrowsPoint,Md. B2 ..4.75

FLOOR PLATES
Cleveland J5 .....4.75
Conshohocken,Pa. A3 ..4.75
Harrisburg,Pa. C5 ....5.95
Ind.Harbor, Ind. I-2 ....4.75
Munhall,Pa. U5 .....4.75
So.Chicago, Ill. U5 ....4.75

PLATES, Ingot Iron
Ashland,c.l.(15) ,A10 ...3.95
Ashland,lcl(15) A10 ....4.45
Cleveland,c.l. R2 .....4.30
Warren,O.,c.l. R2 .....4.30

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Ashland,Ky.(15) A10 ..3.70
Bessemer,Ala. T2 .....3.70
Clairton,Pa. U5 .....3.70
Claymont,Del. C22 ....4.15
Cleveland J5, R2 .....3.70
Coatesville,Pa. L7 ....4.15
Conshohocken,Pa. A3 ...4.15
Fairfield,Ala. T2 .....3.70
Fontana,Calif.(30) K1 ..4.30
Gary,Ind. U5 .....3.70
GraniteCity,Ill. G4 ....4.40
Geneva,Utah, G1 .....3.70
Harrisburg,Pa. C5 .....6.75
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Minnequa,Colo. C10 ....4.50
Munhall,Pa. U5 .....3.70
Pittsbugh J5 .....3.70
Seattle B3 .....4.60
Sharon,Pa. S3 .....3.95
So.Chicago,Ill. U5, W14.3.70
SparrowsPoint,Md. B2 ..3.70
Steubenville,O. W10 ....3.70
Warren,O. R2 .....3.70
Weirton,W.Va. W6 ....4.00
Youngstown R2, U5, Y1..3.70

PLATES, Carbon A.R.
Fontana,Calif. K1 .....5.45
Geneva,Utah G1 .....4.85

PLATES, Wrought Iron
Economy,Pa. B14 .....8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Alton,Ill. L1 .....4.15
Atlanta,Ga. A11 .....4.25
Bessemer,Ala. T2 .....3.70
Buffalo R2 .....3.70
Canton,O. R2 .....3.70
Clairton,Pa. U5 .....3.70
Cleveland R2 .....3.70
Detroit R7 .....3.85
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana, Calif. K1 ....4.40
Gary,Ind. U5 .....3.70
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
KansasCity, Mo. S5 ....4.30
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.20
Minnequa,Colo. C10 ....4.15
Niles,Calif. P1 .....5.05
N.Tonawanda,N.Y. B11.3.70
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B3, N14 .....4.45
So.Chicago R2,U5,W14 .3.70
So.Duquesne,Pa. U5 ...3.70
So.SanFran.,Cal. B3 ...4.45
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 ....4.40
Weirton,W.Va. W6 ....3.85
Youngstown R2, U5 ....3.70

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 .....3.70
Atlanta A11 .....4.25
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Niles,Calif. P1 .....5.05
Portland,Oreg. O4 ....4.65
SanFrancisco S7 .....4.85

BAR SIZE ANGLES;H.R. CARBON
Bethlehem,Pa B2 .....3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ....4.30
Buffalo R2 .....4.30
Canton,O. R2 .....4.30
Canton,O.(29) T7 .....3.95
Clairton,Pa. U5 .....4.30
Detroit R7 .....4.45
Ecorse,Mich. G5 .....4.65
Fontana,Calif. K1 .....5.35
Gary,Ind. U5 .....4.30
Houston,Tex. S5 .....4.70
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....5.35
Massillon,O. R2 .....4.30
Midland,Pa. C18 .....4.30
So.Chicago R2,U5,W14..4.30
So.Duquesne,Pa. U5 ...4.30
Struthers,O. Y1 .....4.30
Warren,O. C17 .....4.30
Youngstown U5 .....4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.55
Gary, Ind. U5 .....4.55
Youngstown U5 .....4.55

BARS & SMALL SHAPES, H. R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.55
Bessemer,Ala. T2 .....5.55
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.55
Cleveland R2 .....5.55
Fairfield,Ala. T2 .....5.55
Fontana,Calif. K1 ....6.60
Gary,Ind. U5 .....5.55
Ind.Harbor,Ind. I-2 ....5.55
IndianaHarbor,Ind. Y1 ..6.05
Johnstown,Pa. B2 .....5.55
Lackawanna,N.Y. B2 ..5.55
LosAngeles B3 .....6.25
Pittsburgh J5 .....5.55
Seattle B3 .....6.30
So.Duquesne,Pa. U5 ...5.55
So.SanFrancisco B3 ....6.30
Struthers, O. Y1 .....6.05
Youngstown U5 .....5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....4.55
BeaverFalls,Pa. M12,R2.4.55
Buffalo B5 .....4.60
Camden,N.J. P13 .....5.00
Carnegie,Pa. C12 .....4.55
Chicago W18 .....4.55
Cleveland A7, C20 ....4.55
Detroit P17 .....4.70
Donora,Pa. A7 .....4.55
Elyria,O. W8 .....4.55
FranklinPark,Ill. N5 ...4.55
Gary,Ind. R2 .....4.55
GreenBay, Wis. F7 .....4.55
Hammond,Ind. L2, M13.4.55
Hartford,Conn. R2 .....5.10
Harvey,Ill. B5 .....4.55
LosAngeles R2 .....6.00
Mansfield,Mass. B5 ....5.10
Massillon,O. R2, R8 ....4.55
Monaca, Pa. S17 .....4.55
Newark,N.J. W18 .....5.00
Plymouth,Mich. P5 ....4.80
Pittsburgh J5 .....4.55
Putnam,Conn. W18 ....5.10
Readville,Mass. C14 ....5.10
St.Louis,Mo. M5 .....4.95
So.Chicago,Ill. W14 ....4.55
SpringCity,Pa. (5) K3 ..5.00
Struthers,O. Y1 .....4.55
Waukegan,Ill. A7 .....4.55
Youngstown F3, Y1 ....4.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....5.40
BeaverFalls,Pa. M12 ...5.40
Bethlehem,Pa. B2 .....5.40
Buffalo B5 .....5.40
Camden,N.J. P13 .....5.80
Canton,O. R2 .....5.40
Canton,O.(29) T7 .....4.90
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7 .....5.45
Cleveland C20 .....5.40
Detroit P17 .....5.55
Donora,Pa. A7 .....5.45
Elyria,O. W8 .....5.40
Gary,Ind. R2 .....5.40
Hammond,Ind. L2, M13..5.40
Hartford,Conn. R2 .....5.85
Harvey,Ill B5 .....5.40
Lackawanna,N.Y. B2 ...5.40
Mansfield,Mass. B5 ....5.85
Massillon,O. R2,R8 ....5.40
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.75
Plymouth,Mich. P5 ....5.60
So.Chicago,Ill. R2, W14.5.40
Struthers,O. Y1 .....5.40
Warren,O. C17 .....5.40
Waukegan,Ill. A7 .....5.45
Worcester,Mass. A7 ....5.75
Youngstown F3, Y1 ....5.40

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ....4.75
ChicagoHts(3,4) I-2 ....4.50
Franklin,Pa.(3,4) F5 ...4.75
FortWorth,Tex.(26) T4..4.85
Huntngtn,W.Va.(3) W7 .5.50
Marion,O.(3) P11 .....4.75
Moline,Ill.(3) R2 .....3.80
Tonawanda (3,4) B12 ..4.75
Williamsport(3) S19 ....5.00
Williamsport(4) S19 ....5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 15.00
Dover,(Eng.Bolt) U1 ..13.50
Dover(Wrgt.Iron) U1 ..12.25
Economy,Pa.(S.R.) B14.9.60
Economy,Pa.(D.R.)B14 11.90
Economy,(Staybolt)B14 12.20
McK.Rks.(Staybolt) L5.14.50
McK.Rks.(S.R.) L5 ....9.60
McK.Rks.(D.R.) L5 ....13.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..3.70
Atlanta A11 .....4.25
Buffalo R2 .....3.70
Cleveland R2 .....3.70
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1..3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.20
Minnequa,Colo. C10 ....4.15
Niles,Calif. P1 .....5.05
No.Tonawanda,N.Y. B11.3.70
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B3, N14 .....4.45
So.Chicago R2,U5,W14 .3.70
So.Duquesne,Pa. U5 ...3.70
So.SanFran.,Cal. B3 ...4.45
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 ....4.40
Weirton,W.Va. W6 ....3.85
Youngstown R2, U5 ....3.70

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ....4.75
ChicagoHts(3,4) I-2 ....4.50
Franklin,Pa.(3,4) F5 ...4.75
FortWorth,Tex.(26) T4..4.85
Huntngtn,W.Va.(3) W7 .5.50
Marion,O.(3) P11 .....4.75
Moline,Ill.(3) R2 .....3.80
Tonawanda (3,4) B12 ..4.75
Williamsport(3) S19 ....5.00
Williamsport(4) S19 ....5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 15.00
Dover,(Eng.Bolt) U1 ..13.50
Dover(Wrgt.Iron) U1 ..12.25
Economy,Pa.(S.R.) B14.9.60
Economy,Pa.(D.R.)B14 11.90
Economy,(Staybolt)B14 12.20
McK.Rks.(Staybolt) L5.14.50
McK.Rks.(S.R.) L5 ....9.60
McK.Rks.(D.R.) L5 ....13.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..3.70
Atlanta A11 .....4.25
Buffalo R2 .....3.70
Cleveland R2 .....3.70
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1..3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.20
Minnequa,Colo. C10 ....4.15
Niles,Calif. P1 .....5.05
No.Tonawanda,N.Y. B11.3.70
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B3, N14 .....4.45
So.Chicago R2,U5,W14 .3.70
So.Duquesne,Pa. U5 ...3.70
So.SanFran.,Cal. B3 ...4.45
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 ....4.40
Weirton,W.Va. W6 ....3.85
Youngstown R2, U5 ....3.70

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ..3.60
Ashland,Ky.(8) A10 ...3.60
Butler,Pa. A10 .....3.60
Cleveland J5, R2 .....3.60
Conshohocken,Pa. A3 ..4.00
Detroit M1 .....4.40
Ecorse,Mich.(8) G5 ....3.80
Fairfield,Ala. T2 .....3.60
Fontana,Calif. K1 .....4.55
Gary,Ind. U5 .....3.60
Geneva,Utah G1 .....3.70
GraniteCity,Ill. G4 ....4.30
Ind.Harbor,Ind. I-2, Y1..3.60
Irvin,Pa. U5 .....3.60
Lackawanna,N.Y. B2 ...3.60
Munhall,Pa. U5 .....3.60
Niles,O. N12 .....5.25
Pittsburg,Calif. C11 ....4.30
Pittsburgh J5 .....3.60
Sharon,Pa. S3 .....4.00
So.Chicago,Ill. W14 ....3.60
SparrowsPoint,Md. B2 ..3.60
Steubenville,O. W10 ....3.60
Torrance,Calif. C11 ....4.30
Warren,O. R2 .....3.60
Weirton,W.Va. W6 ....3.60
WestLeechburg,Pa. A4..3.75
Youngstown U5, Y1 ....3.60

SHEETS, H.R., (19 gage)
AlabamaCity,Ala. R2 ...475
Dover,O. R1 .....5.65
Ind.Harbor,Ind I-2, ...5.40
Mansfield,O. E6 .....5.65
Niles,O. N12 .....5.75
Torrance,Calif. C11 ....5.40

SHEETS, H.R. (14-ga., heavier)
High-Strength Low-Alloy
Cleveland J5, R2 .....5.40
Conshohocken,Pa. A3 ..5.65
Ecorse,Mich. G5 .....5.95
Fairfield,Ala. T2 .....5.40
Fontana,Calif. K1 .....6.35
Gary,Ind. U5 .....5.40
Ind.Harbor,Ind. I-2 ....5.40
IndianaHarbor,Ind. Y1..5.90
Irvin,Pa. U5 .....5.40
Lackawanna(35) B2 ....5.40
Pittsburgh J5 .....5.40
Sharon,Pa. S3 .....5.40
So.Chicago,Ill. U5 ....5.40
SparrowsPoint(36) B2 ..5.40
Warren,O. R2 .....5.40
Weirton,W.Va. W6 ....5.75
Youngstown U5 .....5.40
Youngstown Y1 .....5.90

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 .....6.55
Ecorse,Mich. G5 .....7.10
Fontana,Calif. K1 .....7.50
Gary,Ind. U5 .....6.55
IndianaHarbor,Ind. Y1..7.05
IndianaHarbor,Ind. I-2 ..6.55
Irvin,Pa. U5 .....6.55
Lackawanna(37) B2 ....6.55
Pittsburgh J5 .....6.55
SparrowsPoint(38) B2 ..6.55
Warren,O. R2 .....6.55
Weirton,W.Va. W6 ....6.90
Youngstown Y1 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland J5, R2	4.35
Ecorse,Mich. G5	4.55
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.35
GraniteCity,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10
Torrance,Calif. C11	5.10

BLUED Stock, 29 ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23)F4	6.85

ROOFING SHORT TERNES (8 lb. Coated)

Gary,Ind. U5	9.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

SHEETS, Culvert No. 16	Cu Alloy	Cu Fe
Ashland,Ky. A10.	5.60	...
Canton,O. R2	5.65	6.10
Fairfield,Ala. T2.	5.60	5.85
Gary U5	5.60	5.85
IndianaHarbor I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo,Ind. C16	6.25	...
MartinsFy,O. W10	5.60	5.85
Pittsburg,Cal. C11	6.35	...
SparrowsPt. B2..	5.60	...
Torrance,Cal. C11	6.35	...

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TINPLATE,American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa J5	$8.45	$8.70
Fairfield,Ala. T2.	8.55	8.80
Gary,Ind. U5	8.45	8.70
Ind.Har. I-2, Y1.	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.,Cal. C11	9.20	9.45
Sp.Pt.,Md. B2	8.55	8.80
Warren,O. R2	8.45	8.70
Weirton,W.Va. W6	8.45	8.70
Yorkville,O. W10.	8.45	8.70

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor,Ind. I-2, Y1.	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2.	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

STRIP, Hot-Rolled Alloy

Bridgprt,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10
Midland,Pa. C18	5.85
NewBritn,Conn.(10) S15	5.45
Sharon,Pa. S8	5.85
Youngstown U5	5.50

STRIP, Hot-Rolled, High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1.	5.80
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3.	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill. L1	3.95
Ashland,Ky(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt,Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1.	3.50
Johnstown,Pa.(25) B2	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32)B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.00
Minnequa,Colo. C10	4.55
NewBritain(10) S15	4.00
No.Tonawanda,N.Y. B11.	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.SanFrancisco B3	4.25
SparrowsPoint,Md. B2	3.50
Torranoe,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4.	3.75
Youngstown U5, Y1	3.50

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)S15	10.75
Carnegie,Pa. S18	10.60
Cleveland A7	10.00
Dover,O. G6	10.60
Fontana,Calif. K1	11.65
Harrison,N.J. C18	10.60
Midland,Pa. C18	10.60

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...	...	7.70	9.65	....
Carnegie,Pa. S18	...	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	...	....
Detroit D2	5.60	6.65	7.25	...	....
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18	....	...	7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	....
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35	...	....
NewYork W3	....	7.10	7.70	9.65	11.95
Pawtucket,R.I. N8: Cleve.orPitts.Base	...	6.80	7.40	9.35	11.65
Worcester,Mass.,Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	....	...	7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	...	6.80	7.40	9.35	11.65

Spring Steel (Tempered)

Trenton,N.J. R5	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork W3	...	...	10.30	12.50	15.35

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgeprt,Conn.(10) S15	5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
FranklinPark,Ill.(40)T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
LosAngeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle(40) E5	5.25
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) N8	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

TIN PLATE, Electrolytic (Base Box)	0.25-lb	0.50 lb	0.75lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom W10 (cut-lengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
GraniteCity,Ill.G4 (cut lengths)	...	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths)	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)	...	6.75	7.25	...	...
Vandergrift,Pa. U5	...	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower) Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	....	....	....
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	....	....	....
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bolardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire

G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky. (8) A10	3.75
Warren,O. R2	4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.25

TIGHT COOPERAGE HOOP

Atlanta A11	4.05
Riverdale,Ill. A1	3.90
Sharon,Pa. S3	4.15
Youngstown U5	3.75

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
Alabama City R2	5.70	5.95
Aliquippa J5	5.70	6.15
Atlanta A11	5.95	6.40
Bartonville(19) K4	5.70	6.15
Buffalo W12	4.85	...
Cleveland A7	5.70	6.15
Crawfordsville M8	5.95	6.40
Donora,Pa. A7	5.70	6.15
Duluth,Minn. A7	5.70	6.15
Fairfield T2	5.70	6.15
Houston, Tex. S5	6.10	6.55
Johnstown B2	5.70	6.15
Joliet, Ill. A7	5.70	6.15
KansasCy,Mo. S5	6.30	6.75
Kokomo C16	5.80	6.05
LosAngeles B3	6.65	...
Minnequa C10	5.95	6.45
Monessen P7	5.95	6.40
Palmer W12	5.15	...
Pitts,Calif. C11	6.65	6.80
Prtsmth.(18)P12	6.10	6.60
Rankin A7	5.70	6.15
So.Chicago R2	5.70	5.95
So.S.Fran. C10	6.65	7.10
SparrowsPt. B2	5.80	6.25
Sterling,Ill.(1)N15	5.70	6.15
Struthers,O. Y1	5.70	6.15
Torrance,Cal. C11	6.65	...
Worcester A7	6.00	6.45

WIRE (16 gage)	An'ld Stone	Galv. Stone
Aliquippa J5	10.15	12.15
Bartonville(1) K4	10.25	11.95
Cleveland A7	10.25	12.15
Crawfrdsville M8	10.30	12.00
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.25	12.15
Kokomo C16	10.25	11.95
Minnequa C10	10.40	12.40
Palmer,Mass.C12	10.25	12.15
Pitts.Cal. C11	10.60	12.50
Prtsmth.(18) P12	10.55	12.30
SparrowsPt. B2	10.35	12.25
Waukegan A7	10.25	12.15

ROPE WIRE	(A)	(B)
Alton,Ill. L1	8.65	8.90
Bartonville,Ill. K4	8.55	8.80
Buffalo W12	8.55	8.80
Fostoria,O. S1	8.85	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7	8.80	9.05
Palmer,Mass. W12	8.85	9.10
Portsmouth,O. P12	8.55	8.80
Roebling,N.J., R5	8.85	9.10
SparrowsPt. B2	8.65	8.90
Struthers,O. Y1	8.55	8.80
Worcester J4, T6	8.85	9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	4.85
Aliquippa,Pa. J5	4.85
Atlanta A11	5.10
Alton,Ill. L1	5.05
Bartonville,Ill.(1) K4	4.85
Buffalo W12	4.85
Chicago W13	5.10
Cleveland A7, C20	4.85
Crawfordsville,Ind. M8	5.10
Donora,Pa. A7	4.85
Duluth,Pa. A7	4.85
Fairfield,Ala. T2	4.85
Fostoria,O.(24) S1	5.35
Houston S5	5.25
Johnstown,Pa. B2	4.85
Joliet, Ill. A7	4.85
KansasCity,Mo. S5	5.45
Kokomo,Ind. C16	4.95
Los Angeles B3	5.80
Minnequa,Colo. C10	5.10
Monessen,Pa. P7	5.10
Newark, 6-8 ga. I-1	5.50
No.Tonawanda B11	4.85
Palmer, Mass W12	5.15
Pittsburg, Calif. C11	5.80
Portsmouth,O. P12	5.25
Rankin,Pa. A7	4.85
So.Chicago,Ill. R2	4.85
So. SanFrancisco C10	5.80
SparrowsPoint,Md. B2	4.95
Sterling,Ill.(1) N15	4.85
Struthers,O. Y1	4.85
Torrance,Calif. C11	5.80
Waukegan,Ill. A7	4.85
Worcester,Mass. A7, T6	5.15

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12	6.35
Cleveland A7	5.85
Crawfordsville,Ind. M8	6.20
Detroit D2	6.20
Dover,O. G6	6.20
Fostoria,O. S1	6.00
Kokomo,Ind. C16	5.70
Franklin Park,Ill. T6	6.20
Massillon,O. R8	5.85
Monessen,Pa. P16	5.85
Monessen,Pa. P7	6.10
NewHaven,Conn. D2	6.50
Pawtucket,R.I.(12) N8	6.85
Trenton,N.J. R5	6.05
Worcester A7	6.15
Worcester T6	6.50
Worcester W12	6.65

WIRE, Fine & Weaving(8" Coils)

Bartonville,Ill.(1) K4	8.90
Buffalo W12	8.90
Chicago W13	8.90
Cleveland A7	8.90
Crawfordsville, Ind. M8	8.95
Fostoria,O. S1	8.90
Johnstown,Pa. B2	8.90
Kokomo,Ind. C16	8.90
Monessen,Pa. P16	8.90
Palmer,Mass W12	9.20
Portsmouth,O. P12	8.90
Roebling,N.J. R5	9.20
Waukegan,Ill. A7	8.90
Worcester,Mass. A7, T6	9.20

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.50
Monessen,Pa. P16	8.50
Roebling,N.J. R5	8.80
SparrowsPoint,Md. B2	8.60
Johnstown,Pa. B2	8.50

WIRE, Tire Bead

Bartonville,Ill(1) K4	10.90
Monessen,Pa. P16	11.40
Roebling,N.J. R5	11.55

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	6.25
Alton,Ill. L1	6.45
Bartonville,Ill.(1) K4	6.25
Buffalo W12	6.25
Cleveland A7	6.25
Donora,Pa. A7	6.25
Duluth A7	6.25
Fostoria,O. S1	6.25
Johnstown,Pa. B2	6.25
LosAngeles B3	7.20
Milbury,Mass.(12) N6	8.05
Monessen,Pa. P7, P16	6.25
Palmer,Mass. W12	6.55
Pittsburg,Calif. C11	7.20
Roebling,N.J. R5	6.55
Portsmouth,O. P12	6.25
So.Chicago,Ill. R2	6.25
SoSanFrancisco C10	7.20
SparrowsPoint,Md. B2	6.35
Struthers,O. Y1	6.25
Trenton,N.J. A7	6.55
Waukegan,Ill. A7	6.25
Worcester A7, T6, W12	6.55
Worcester,Mass J4	6.75

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.90
Alton,Ill. L1	6.10
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth,Minn. A7	5.90
Johnstown,Pa. B2	5.90
LosAngeles B3	6.85
Monessen,Pa. P7, P16	5.90
NewHaven,Conn. A7	6.20
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
So.SanFrancisco C10	6.85
SparrowsPoint,Md. B2	6.00
Torrance,Calif. C11	6.85
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Worcester,Mass. A7	6.20

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala. R2	126
Ala.City,Ala.,17-18ga.R2	213
Aliquippa,Pa.9-14½ga.J5	130
Atlanta A11	133
Bartonville,Ill.(19) K4	130
Crawfordsville,Ind. M8	132
Donora,Pa. A7	130
Duluth,Minn. A7	130
Fairfield,Ala. T2	130
Houston,Tex. S5	138
Johnstown,Pa. B2	130
Johnstown,17ga.,6" B2	204
Johnstown,17ga.,4" B2	207
Joliet,Ill. A7	130
KansasCity,Mo. S5	142
Kokomo,Ind. C16	132
Minnequa,Colo. C10	138
Monessen,Pa. P7	135
Pittsburg,Calif. C11	153
Portsmouth,O.(18) P12	137
Rankin,Pa. A7	130
So.Chicago,Ill. R2	126
Sterling,Ill.(1) N15	130

FENCE POSTS

ChicagoHts.,Ill. C2	140
Duluth,Minn. A7	125
Franklin,Pa. F5	140
Huntington,W.Va. W7	140
Johnstown,Pa. B2	140
Marion,O. P11	140
Minnequa,Colo. C10	130
Moline,Ill. R2	136
So.Chicago R2	140
Tonawanda,N.Y. B12	140
Williamsport,Pa. S19	150

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	136
Aliquippa,Pa. J5	140
Atlanta A11	143
Bartonville,Ill.(19) K4	143
Crawfordsville,Ind. M8	145
Donora,Pa. A7	140
Duluth,Minn. A7	140
Fairfield,Ala. T2	140
Houston,Tex. S5	148
Johnstown,Pa. B2	140
Joliet,Ill. A7	140
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142
Minnequa,Colo. C10	146
Monessen,Pa. P7	145
Pittsburg,Calif. C11	160
Portsmouth,O.(18) P12	147
Rankin,Pa. A7	140
So.Chicago,Ill. R2	136
So.SanFran.,Calif. C10	160
SparrowsPoint,Md. B2	142
Sterling,Ill.(1) N15	140

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	123
Atlanta A11	126
Bartonville,Ill.(19) K4	123
Crawfordsville,Ind. M8	132
Donora,Pa. A7	123
Duluth,Minn. A7	123
Fairfield,Ala. T2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	128
Pittsburg,Calif. C11	147
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	147
SparrowsPoint,Md. B2	125
Sterling,Ill.(1) N15	123

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	6.10
Bartonville,Ill.(19) K4	5.95
Crawfordsville,Ind. M8	6.30
Donora,Pa. A7	5.95
Duluth,Minn. A7	5.95
Johnstown,Pa. B2	5.95
Joliet,Ill. A7	5.95
Kokomo,Ind. C16	6.05
Minnequa,Colo. C10	6.20
Pittsburg,Calif. C11	6.90
Portsmouth,O. P12	6.25
Rankin,Pa. A7	5.95
So.Chicago,Ill. R2	6.10
SparrowsPoint,Md. B2	6.05
Sterling,Ill.(1) N15	5.65
Worcester,Mass. A7	6.25

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$7.35
Wheeling,W.Va. W10	7.35

NAILS & STAPLES, Stock

To dealers & mfrs. (1)	Col.
AlabamaCity,Ala. R2	118
Aliquippa,Pa.(13) J5	118
Atlanta A11	121
Bartonville,Ill.(19) K4	118
Chicago,Ill. W13	118
Cleveland A9	125
Crawfordsville,Ind. M2	122
Donora,Pa. A7	118
Duluth,Minn. A7	118
Fairfield,Ala. T2	118
Galveston,Tex. D7	126
Houston,Tex. S5	126
Johnstown,Pa. B2	118
Joliet,Ill. A7	118
KansasCity,Mo. S5	130
Kokomo,Ind. C16	120
Minnequa,Colo. C10	123
Monessen,Pa. P7	124
Pittsburg,Calif. C11	137
Portsmouth,O. P12	124
Rankin,Pa. A7	118
So.Chicago,Ill. R2	118
SparrowsPoint,Md. B2	120
Sterling,Ill.(1) N15	118
Torrance,Calif. C11	138
Worcester,Mass. A7	124

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.40
Lebanon,Pa. B2	6.15
Minnequa,Colo. C10	6.15
Pittsburgh J5	6.15
Seattle B3	6.65
So.Chicago,Ill. R2	6.15
Struthers,O. Y1	6.15
Youngstown R2	6.15

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.85
Lebanon,Pa.(32) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh O3, P14	9.85
Seattle B3	10.35

TIE PLATES

Fairfield,Ala. T2	4.50
Gary,Ind. U5	4.50
Ind.Harbor,Ind. I-2	4.50
Lackawanna,N.Y. B2	4.50
Minnequa,Colo. C10	4.50
Pittsburg,Calif. C11	4.65
Seattle B3	4.65
Steelton,Pa. B2	4.50
Torrance,Calif. C11	4.65

JOINT BARS

Bessemer,Pa. U5	4.70
Fairfield,Ala. T2	4.70
Ind.Harbor,Ind. I-2	4.70
Joliet,Ill. U5	4.70
Lackawanna,N.Y. B2	4.70
Minnequa,Colo. C10	4.70
Steelton,Pa. B2	4.70

AXLES

Ind.Harbor,Ind. S18	5.60
Johnstown,Pa. B2	5.60

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	3.60	3.50	3.55	4.00
Ensley,Ala. T2	3.60	3.50	...	4.00
Fairfield,Ala. T2	...	...	...	4.00
Gary,Ind. U5	3.60	3.50	3.55	...
Huntington,W.Va. W7	...	...	...	5.00
Ind.Harbor,Ind. I-2	3.60	3.50	3.55	...
Johnstown,Pa. B2	...	...	...	(16)4.00
Lackawanna B2	3.60	3.50	...	4.00
Minnequa,Colo. C10	3.60	3.50	...	4.50
Steelton,Pa. B2	3.60	3.50	...	...
Williamsport,Pa. S19	...	...	...	4.75

TOOL STEEL

—Grade by Analysis—

Grade	$ per lb	W	Cr	V	Co	Mo	$ per lb
Reg. Carbon	0.230	20.25	4.25	1.6	12.25	..	3.535-3.675
Extra Carbon	0.270	19	4	2	7	..	2.460
Spec. Carbon.	0.325	18.25	4.25	1	4.75	..	2.125
Oil Hardening.	0.350	18	4	2	9	..	2.445-2.450
5%CrHotWrk	0.350	13.5	4	3	..	..	1.60¼
Hi-Carbon-Cr.	0.635	6.4	4.5	1.9	..	5	0.96-0.965
18W,4Cr,1V	1.505	6	4	3	..	6	1.190
18W,4Cr,2V	1.650	1.5	4	1	..	8.5	0.810

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2, V3.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel

M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 NewEng-HighCarb.,Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield, S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.

U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 YoungstownSheet&Tube

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ¼" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. base.
(22) Del. San Fran. Bay area.
(23) 28 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.00c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Subject to 10% increase.
(30) Sheared: add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. edge or square edge.
(33) To jobbers, deduct 20 cents.
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.

Need fast production of small metal parts...now?

- get a FERRACUTE SUPER SPEED PRESS
- get PROMPT, DEPENDABLE DELIVERY
- get continuous, sustained operation up to 500 STROKES PER MINUTE.

FIGURE out for yourself what production records like these could do to your costs on blanking and piercing operations:

One company—2000 blanks (4 per stroke) per minute consistently for years.

Another big manufacturer—ONE MILLION laminations for aircraft generators on a SUPER SPEED in a 48-hour week with only one operator.

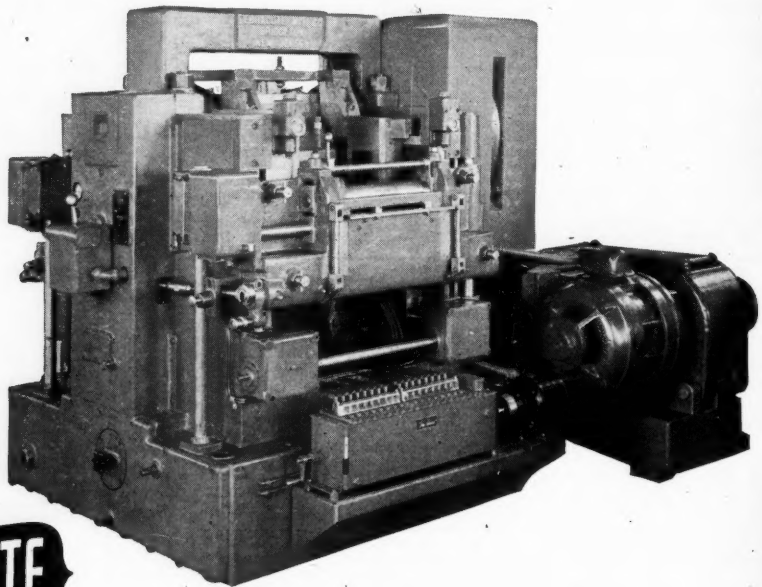
Again, SUPER SPEED turns out 120,000 pieces per 8-hour day compared to 50,000 with a regular punch press equipped with automatic feed and to 9,000 with a hand-fed punch press.

Such production is revolutionary. The FERRACUTE SUPER SPEED PRESS is itself revolutionary, the die bed reciprocating in a horizontal plane and the punch member taking its motion direct from the crank shaft. There is no lost motion because the material moves continuously while the work is being performed. Production speeds are limited only by the physical characteristics of the product and the maximum speed of the machine. FERRACUTE SUPER SPEED takes standard die sets, reduces die costs because of less frequent grinding. Has worked successfully on a considerable variety of metals: electrical grade steel, cold rolled steel, nickel alloy steel, brass, copper, etc. Feed by coil or strip. Models from 250 to 1000 RPM. Write for full details.

FERRACUTE MACHINE COMPANY

Super Speed Press Division
Bridgeton, New Jersey, U.S.A.

Manufacturers of Power Press and Special Machinery



FERRACUTE
SINCE 1863

SUPER SPEED PRESS

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	34.0	32.0	29.0	1.5	+0.5	+3.5
¼	6.0	0.42	28.5	26.5	23.5	+1.0	+3.0	+6.0
⅜	6.0	0.57	23.5	21.5	18.5	+7.0	+9.0	+12.0
½	8.5	0.85	36.0	34.0	35.0	14.0	12.0	13.0
¾	11.5	1.18	39.0	37.0	38.0	18.0	16.0	17.0
1	17.0	1.68	41.5	39.5	40.5	21.5	19.5	20.5
1¼	23.0	2.28	42.0	44.0	41.0	22.0	24.0	21.0
1½	27.5	2.78	42.5	41.5	41.5	23.0	21.5	22.0
2	37	3.68	43.0	41.0	42.0	23.5	21.5	22.5
2½	58.5	5.82	43.5	41.5	42.5	24.0	22.0	23.0
3	76.5	7.62	43.5	41.5	42.5	24.0	22.0	23.0

Column A: Etna, Pa. N2; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 3½ points lower on ⅛" 1½ points lower on ¼", and 2 points lower on ⅜", W10; Sharon, Pa. M6, 1 point higher on ⅛", 2 points lower on ¼" and ⅜". Following make ½" and larger: Lorain, O., N3; Youngstown R2 and 36¼ % on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5; Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24% on 3½" and 4". Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y1; Alton, Ill., 2 points lower discount L1.

Column D: Butler, Pa. F6, ⅛-⅜"; Benwood, W. Va. W10, except plus 3½ % on ⅛", plus 2½ % on ¼", plus 9% on ⅜"; Sharon, Pa. M6, plus 0.5 on ⅛", 1 point lower on ½", ¾", 1¼ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, and 16½ % on 3½" and 4"; Youngstown Y1. Aliquippa, Pa. J5 quotes 1 point lower on ¾", 2 points lower on 1", 1½ points lower on 1¼", 2 points lower on 1½" and 2", 1½ points lower on 2½" and 3"; Etna, Pa. N2 and 18½ % on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	29.5	9.5	29.5	9.5
2½	58.5	5.82	32.5	12.5	32.5	12.5
3	76.5	7.62	32.5	12.5	32.5	12.5
3½	92.0	9.20	34.5	14.5	34.5	14.5
4	$1.09	10.89	34.5	14.5	34.5	14.5
5	1.48	14.81	37.0	17.0	37.0	17.0
6	1.92	19.18	37.0	17.0	37.0	17.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6 in.; Lorain N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft. mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. in.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1⅝	13	19.29	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2½	12	26.92	32.97	26.98	31.76
2⅝	12	29.65	36.32	29.57	34.76
2¾	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding	Plates Carbon Base 10%	Plates Carbon Base 20%	Strip Cold-Rolled Carbon Base Both Sides	Sheets Carbon Base 10%	Sheets Carbon Base 20%	Sheets Cu Base Both Sides
Stainless						
302	....	....	....	19.75	26.24–27.50	77.00
304	25.00	29.50	....	24.50	27.50–27.77	77.00
309	30.50	35.00	....	....	....	....
310	36.50	41.00	....	....	....	144.00
316	29.50	34.00	....	26.00	35.92–36.50	....
317	34.50	39.00	....	....	....	....
318	33.50	38.00	....	....	....	....
321	26.50	31.00–32.00	....	23.00	33.00	111.00
347	27.50	32.00	....	24.00	33.50–33.83	130.00
405	21.25	27.75	....	....	....	....
410	20.75	27.25	....	....	....	....
Nickel	33.55	45.15	41.00	54.00	....	....
Inconel	41.23	54.18	....	....	....	165.00
Monel	34.93	46.28	....	....	....	....
Copper*	....	....	23.70†	29.65‡	....	....

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS
(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:
- ½-in. & smaller diam. 15
- ⅝-in. & ¾-in. 18.5
- ⅞-in. and larger 17.5

Longer than 6 in.:
- All diams. 14

Lag bolts, all diams.:
- 6 in. and shorter 23
- over 6 in. long 21

Ribbed Necked Carriage 18.5
Blank 34
Plow 34
Step, Elevator, Tap, and Sleigh Shoe 21
Tire bolts 12
Boiler & Fitting-Up bolts 31

NUTS

H.P. & C.P.	Reg.	Heavy
Square:		
½-in. & smaller	15	15
⅝-in. & ¾-in.	12	6.5
⅞-in.-1½-in.	9	1
1⅝-in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ¾-in.	16.5	6.5
⅞-in.-1½-in.	12	2
1⅝-in. & larger	8.5	2
C.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ¾-in.	23	17.5
⅞-in. & 1½-in.	19.5	12
1⅝-in. & larger	12	6.5

SEMIFINISHED NUTS
American Standard

(Per cent off list for less than case or key quantities)

	Reg.	Hvy.
½-in. & smaller	35	28.5
⅝-in. & ¾-in.	29.5	22
⅞-in.-1½-in.	24	15
1⅝-in. & larger	13	8.5
	Light	
⅞-in. & smaller	35	
½-in. to ⅝-in.	28.5	
¾-in. to 1½-in.	26	

STEEL STOVE BOLTS
(F.o.b. plant; per cent off list in packages)
Plain finish ..... 48 & 10
Plated finishes ... 31 & 10

HEXAGON CAP SCREWS
(1020 steel; packaged; per cent off list)

6 in. or shorter:
- ⅝-in. & smaller 42
- ⅞-in. through 1 in. 34

Longer than 6 in.:
- ⅝-in. & smaller 26
- ¾-in. through 1 in. 4

SQUARE HEAD SET SCREWS
(Packaged; per cent off list)
1 in. diam. x 6 in. and shorter 38
1 in. and smaller diam. x over 6 in. 26

HEADLESS SET SCREWS
(Packaged; per cent off list)
No. 10 and smaller 35
¼-in. diam. & larger ... 16
N.F. thread, all diams. . 10

RIVETS

F.o.b. midwestern plants
Structural ½-in., larger 7.85c
⅞-in. under ..... 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers . .List to list-plus-$1.

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70%, $43; 60%, $40.
Imported, net ton, duty paid, metallurgical grade, $33-$35.

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Diam.	Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95
	CARBON	
35, 40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.25	36.75	31.50
303	43.25	40.25	34.00
304	43.25	38.75	33.00
309	56.00	55.00	44.75
316	57.00	59.00	49.25
321	49.25	48.25	37.00
347	53.75	52.25	41.50
410	36.50	30.50	25.75
416	37.00	37.00	26.25
420	44.00	47.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Baltimore, Tpes 301 through 347 sheet, except 303 and 309 E2.
Brackenridge, Pa., sheets A4 quotes slight variations on Tpes 301-347.
Bridgeville, Pa., bars, wire, sheets & strip U4.
Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.
Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 and 0.25c lower on Types 302, 304, 321, 347; 0.50c lower on Types 309 and 316 S18.
Cleveland, strip A7.
Detroit, strip M1 quotes 34.00 on Type 301, 36.50 on 302 38.50 on 304, 58.50 on 316, 52.00 on 347, 30.50 on 410, and 31.00 on 430.
Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.
Duquesne, Pa., bars U5.
Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.
Gary, Ind., sheets except Type 416 U5.
Harrison, N. J., strip and wire C18.
Massillon, O., all products, R2.
McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.
McKeesport, Pa., bars, sheets except Type 416 U5.
Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.
Midland, sheets & strip C18.
Munhall, Pa., bars U5.
Pittsburgh, sheets C18.
Reading, Pa., strip except 34.25c for Type 301 and 56.00c for Type 309; bars, except 31.50c for Type 301 and 45.25c for Type 309 C4.
Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.
So. Chicago, Ill., bars & structurals U5.
Syracuse, N. Y., bars, wire & structurals C18.
Titusville, Pa., bars, U4.
Wallingford, Conn., strip, W2 quotes 0.25c higher.
Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.
Washington, Pa., Types 301 through 347 sheets & strip except 303 & 309; 316 sheets 62.00c, strip 64.00c W4.
Watervliet, N. Y., structurals & bars A4 quotes slight variations on Types 301-347.
Waukegan, bars & wire A7.
West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

COAL CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 30.00-35.00
Toluol, one deg. .. 26.00-33.00
Industrial xylol .. 25.00-33.50
Per ton bulk, ovens
Sulphate of ammonia . $32-$45
Cents per pound, ovens
Phenol, 40 (carlots, nonreturnable drums) .. 17.25

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron	Cents
98+% Fe, carlots	16.00
Swedish, c.l.f. New York, in bags	7.40-8.50
Electrolytic Iron:	
Annealed, 99.5% Fe	42.50
Unannealed, 99 + % Fe	36.50
Unannealed, 99 + % Fe (minus 325 mesh)	56.50
Powder Flakes	48.50
Carbonyl Iron:	
97.9-99.8%, size 5 to 10 microns	83.00-143.00
Aluminum:	
Carlots, freight allowed	29.50
Atomized, 500 lb drums, freight allowed	33.50
Brass, 10-ton lots	30.00-33.25
Bronze, 10-ton lots	51.25-60.00
Phosphor-Copper, 10 tons	50.00
Copper:	
Electrolytic	43.25
Reduced	33.75-37.00
Lead	25.50
Magnesium	75.00-85.00
Manganese:	
Minus 100-mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	83.00
Nickel-Silver, 10-ton lots	44.00
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainless Steel, 302	83.00
Zinc, 10-ton lots	23.00-30.50
Tungsten	Dollars
99%, minus 80 to 200 mesh, freight allowed: 1000 lb and over	4.00
Less than 1000 lb	4.15
98.8% minus 65 mesh, freight allowed: 1000 lb and over	4.15
less than 1000 lb	4.25
Molybdenum:	
99%, minus 80 to 200 mesh, over 500 lb	2.85
200 to 500 lb	3.10
less than 200 lb	3.25
Chromium, electrolytic 99% Cr min.	2.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvll,fur.	$14.50-15.00
Connellsvll,fdry.	17.00-18.00
New River, foundry	21.30
Wise county, foundry	15.95
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J., ovens	$22.75
Everett, Mass., ovens	
New England, del.	*24.80
Chicago ovens	23.00
Chicago, del.	24.40
Terre Haute, ovens	22.50
Milwaukee, ovens	22.75
Indianapolis, ovens	22.75
Chicago, del.	26.42
Cincinnati, del.	25.85
Detroit, del.	26.85
Ironton, O., ovens	22.50
Cincinnati, del.	25.12
Painesville, O., ovens	24.00
Cleveland, del.	25.82
Erie, Pa., ovens	23.50
Birmingham, ovens	20.30
Birmingham, del.	21.89
Philadelphia, ovens	22.70
Nevilleisland,Pa.,ovens	23.00
Swedeland, Pa., ovens	23.60
St. Louis, ovens	
St. Louis, del.	25.40
Portsmouth, O., oven	22.50
Cincinnati, del.	25.12
Detroit, ovens	24.00
Detroit, del.	25.00
Buffalo, del.	26.89
Flint, del.	26.59
Pontiac, del.	23.47
Saginaw, del.	26.92

* Or within $4.15 freight zone from works.

More BALED Scrap

Means More Iron and Steel for You...NOW and in the Future!

How much sheet metal scrap is your plant generating? *How fast* is it finding its way back to the mills, furnaces and foundries in the form of dense, compact bales for the production of new steel and iron?

If you are baling your sheet metal scrap . . . and salvaging your heavy scrap . . . you are helping iron and steel production keep pace with defense and civilian requirements. Keep your scrap baling equipment operating at top capacity . . . and *plan now* to expand and modernize your baling operations to meet future needs.

Galland-Henning offers you competent counsel on your baling problems, based on years of experience in the design, construction and installation of powerful, hydraulic scrap metal balers for steel mills, industrial plants and scrap yards.

GALLAND-HENNING MANUFACTURING CO.
2747 S. 31st ST., MILWAUKEE 46, WIS.

GALLAND-HENNING

SCRAP METAL BALING PRESSES

A 5975-1P

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140‡		Carbon	Floor
New York (city)	6.27	7.29	8.44	6.59	...	6.42	7.29	9.25	6.40	6.58	8.04
New York (c'try)	5.97	6.99	8.14	6.29	...	6.12	6.99	8.95	6.10	6.28	7.74
Boston (city)	6.40	7.20	8.49	6.35	...	6.25	7.04	9.25	6.40	6.98	7.88
Boston (c'try)	6.20	7.00	8.29	6.15	...	6.05	6.84	9.05	6.20	6.78	7.68
Phila. (city)	6.15	7.05	8.25	6.35	...	6.30	7.11	8.90	6.15	6.30	7.40
Phila. (c'try)	5.90	6.80	8.00	6.10	...	6.05	6.86	8.65	5.90	6.05	7.15
Balt. (city)	5.80	7.04	8.27	6.24	...	6.24	7.09	...	6.34	6.60	7.84
Balt. (c'try)	5.60	6.84	8.07	6.04	...	6.04	6.89	...	6.14	5.80	7.44
Norfolk, Va.	6.50	...	...	6.70	...	6.55	7.70	...	6.60	6.50	8.00
Richmond, Va.	5.90	...	8.10	6.10	...	6.10	6.90	...	6.30	6.65	7.80
Wash. (w'hse)	6.02	7.26	8.49	6.46	...	6.46	7.26	...	6.56	6.22	7.86
Buffalo (del.)	5.80	6.60	8.29	6.06	...	5.80	6.65	10.65††	6.00	6.25	7.55
Buffalo (w'hse)	5.60	6.40	8.09	5.86	...	5.60	6.45	10.45††	5.80	6.05	7.35
Pitts. (w'hse)	5.60	6.40*	7.75	5.65-5.95	6.90	5.55	6.40	10.10††	5.70	5.75	7.00
Detroit (w'hse)	5.45-5.78	6.53-6.80	7.99	5.94-5.95	7.75	5.84	6.56	8.91	6.09	6.19-6.35	7.28
Cleveland (del.)	5.80	6.60	8.30	5.89	7.10	5.77	6.60-6.70	8.91	10.02	6.12	7.32
Cleve. (w'hse)	5.60	6.40	8.10	5.69	6.90	5.57	6.40-6.50	8.71	5.82	5.92	7.12
Cincin. (city)	6.02	6.59	7.34	5.95	...	5.95	6.51	...	6.24	6.34	7.50
Chicago (city)	5.80	6.60	7.95	5.75	...	5.75	6.50	10.30	5.90	6.00	7.20
Chicago (w'hse)	5.60	6.40	7.75	5.55	...	5.55	6.30	10.10	5.70	5.80	7.00
Milwaukee (city)	5.94	6.74	8.09	5.89	...	5.89	6.74	10.44	6.04	6.14	7.34
Milwau. (c'try)	5.74	6.54	7.89	5.69	...	5.69	6.54	10.24	5.84	5.94	7.14
St. Louis (del.)	6.05	6.85	8.20	6.00	...	6.00	6.85	10.55	6.23	6.33	7.53
St. L. (w'hse)	5.85	6.65	8.00	5.80	...	5.80	6.65	10.35	6.03	6.13	7.33
Kans. City (city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
KansCity (w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Birm'hm (city)	5.75	6.55	6.90§	5.70	...	5.70	7.53	...	5.85	6.10	8.25
Birm'hm (w'hse)	5.60	6.40	6.75§	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city)	6.55	8.10	9.05§	6.60	8.90	6.55	7.75	...	6.55	6.60	9.20
L. A. (w'hse)	6.35	7.90	8.85§	6.40	8.70	6.35	7.55	...	6.35	6.40	8.70
San Francisco	6.65	7.80§	8.90§	6.60	...	6.45	8.20	...	6.45	6.50	8.60
Seattle-Tacoma	7.05	8.60§	9.20§	7.30	...	6.75	9.10	11.15	6.65	6.75	8.80

*Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; §—500 to 1499 lb; §—450 to 1499 lb; §—3500 lb and over; §—1000 to 1999 lb.

ORES

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore

Cents per unit, del. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	17.00
Brazilian iron ore, 68-69%	24.00-25.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-$1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 79.8-81.8c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00

South African Transvaal

44% no ratio	$27.00-28.00
46% no ratio	34.00-35.00

Brazilian

44% 2.5:1 lump	$32.00

Rhodesian

45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00

Domestic—rail nearest seller

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines	$1.00

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 21.75c per lb of contained Cr. c.l., packed 22.65c, ton lot 23.80c, less ton 25.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%.) Contract, carload, lump, bulk, max. 0.03% C 33.60c per lb of contained Cr, 0.04% C 31.50c, 0.06% C 30.50c, 0.10% C 30.00c, 0.15% C 29.75c, 0.20% C 29.50c, 0.50% C 29.25c, 1% C 29.00c, 1.50% C 28.85c, 2% C 28.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 23.25c per lb of contained Cr, C.l., packed 24.15c, ton 25.50c, less ton 27.25c. Delivered Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, carload, packed, 8 M x D, 16.35c per lb of alloy; ton lot 17.2c; less ton lot, 18.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 21.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 21.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 36-39%, Al 7-9%, C 0.05% max.) 21.75c per lb of contained silicon plus 12.4c per lb of contained silicon plus aluminum, 3" x down, delivered.

Chromium Metal: (Min. 97% Cr and 1% Fe) Contract carload, 1" x D; packed, max 0.50% C grade, $1.08 per lb of contained chromium ton lot $1.10, less ton $1.12. Delivered. Spot add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.00c per lb of contained Si; packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

Note: Current prices on zirconium, calcium and briquetted alloys appeared on page 129, Aug. 27 issue; manganese, titanium and "other" ferroalloys, page 159, Sept. 3, Refractories prices were published on page 129, Aug. 27.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.) Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.5c per lb of contained Si, carload packed 18.7c, ton lot 19.65c, less ton 20.7c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l. lump, bulk, regular 20.0c per lb of Si, c.l. packed 21.2c, ton lot 22.1c, less ton 23.1c. Add 1.5c for max, 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe.) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 200 to 1999 lb 11.65c, smaller lots 12.15c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $3.10 per lb of contained V. Delivered, Spot, add 10c. Crucible-Special Grades (V 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3.20. Primos and High Speed Grades (V 35-55%, Si 1.50% max., C 0.20% max.) $3.30.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 83c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

TUNGSTEN ALLOYS*

Ferrotungsten: (70-80%). 10,000 lb W or more, $5.00 per lb of contained W 2000 lb W to 10,000 lb W, $5.10; less than 2000 lb W, $5.22. **Tungsten Powder:** Carbon Reduced; (W 98.8% min.) 1000 lb or more, $6.00 per lb of contained W; less than 1000 lb W, $6.15.

*Government ceiling prices, effective May 7, 1951, f.o.b. Niagara Falls, N. Y., basis.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Apr. 19, 1951

STEELMAKING SCRAP COMPOSITE

Sept. 6	$44.00
Aug. 30	44.00
July 1951	44.00
Aug. 1950	40.00
Aug. 1946	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Basing Point	No. 1 Heavy Melting Steel (Grade)1 Dealer, Industrial	Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Point, Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 2 Heavy Melting	—$2.00
3. No. 1 Busheling	Base
4. No. 1 Bundles	Base
5. No. 2 Bundles	— 3.00
6. Machine Shop Turnings	—10.00
7. Mixed Borings & Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Busheling	— 4.00
10. Cast Iron Borings	— 6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate:	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
Foundry, Steel:	
20. 2 feet and under	+ 2.00
21. 1 foot and under	+ 4.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free turnings	— 3.00
24. Heavy Turnings	— 1.00

Special Grades

25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+10.00
29. Shafting	+10.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively.
(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.
(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.
(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and open-hearth furnaces or foundries.
(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purpose.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, or 75 cents per ton for covering gondola cars with a weather-resistant covering.
(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts: Where iron content is 85% and over, $6; 75% and over, $10; less than 75%, $12.
(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 heavy melting steel less $15.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap.

2. No. 2 Heavy melting Steel	—$2.00
3. No. 2 Steel Wheels	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats.	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, switches.	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames:	
22. Uncut	Base
23. Cut	+ 3.00
24. Angle, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	+ 8.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	—13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses; otherwise, ceiling shall not exceed that for Grade 14.
(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling shall not exceed that for No. 1 heavy melting steel.
(3) Price for Grade 25 may be charged only when sold for rerolling and forging purposes; otherwise ceiling shall not exceed that for base grade (No. 1).

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:	
1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes.	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery.	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 3 cast iron.
(2) Ceiling shipping point price which any foundry other than a malleable iron producer may pay for Grade 10 shall be ceiling price for No. 1 cast iron.

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 1, No. 2 or No. 3, $8.
(2) For hydraulically compressing Grade No. 4, $6 per ton; Grade No. 5, $8.
(3) For crushing Grade No. 6, $3.
(4) For preparing into Grade No. 25, $6.
(5) For preparing into Grade No. 19, $6.
(6) For preparing into Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.
(7) For preparing into Grade No. 17 or Grade No. 21, $11.
(8) For preparing into Grade No. 18 or Grade No. 20, $12.
(9) For hydraulically compressing Grade No. 15, $8.
(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.
(2) For hydraulically compressing Grade No. 13, $6.
(3) For preparing into Grade No. 16, $4.
(4) For preparing into Grade No. 17, $5.
(5) For preparing into Grade No. 18, $7.
(6) For preparing into Grade No. 21, $4.
(7) For preparing into Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into grade No. 7, $9.
(2) For preparing Grade No. 3 into Grade No. 11, $7.
(3) For preparing Grade No. 3 into Grade No. 1, $4.

Whenever scrap has arrived at its point of delivery and consumer engages a dealer to prepare such scrap, no fee may be charged for such services unless consumer obtains prior written OPS approval.

Commissions

No commissions shall be payable to a broker in excess of $1.

Unprepared Scrap

For unprepared scrap, other than materials suitable for hydraulic compression, ceiling basing point prices shall be $8 per ton beneath ceiling of the prepared base grades.
For unprepared material which when compressed constitutes No. 1 bundles, ceiling basing point price shall be $6 per ton beneath ceiling for No. 1 bundles; or when compressed constitutes No. 2 bundles ceiling basing point price shall be $8 beneath ceiling basing point price for No. 2 bundles.

Premiums for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

Switching Charges

Switching charges to be deducted from basing point prices of dealer, industrial and nonoperating railroad scrap, to determine ceiling shipping point prices for scrap originating in basing points are per gross ton:
Alabama City, Ala., 43c; Ashland, Ky., 47c; Atlanta, 51c.
Bethlehem, Pa., 52c; Birmingham, 50c; Brackenridge, Pa., 53c; Buffalo, 83c; Butler, Pa., 65c.
Canton, O., 51c; Chicago (including Gary, Ind.), $1.34; Cincinnati (including Newport, Ky.), 65c; Claymont, Del. (including Chester, Pa.), 79c; Cleveland, 76c.
Coatesville, Pa., 50c; Conshohocken, Pa., 20c.
Detroit, 95c; Duluth, Minn., 50c.
Harrisburg, Pa., 51c; Houston, Tex., 57c.
Johnstown, Pa., 75c.
Kansas City, Mo., 78c; Kokomo, Ind., 51c.
Middletown, O., 26c; Midland, Pa., 75c; Minnequa, Colo., 33c; Monessen, Pa., 51c.
Phoenixville, Pa., 51c; Pittsburg, Calif., 65c; Pittsburgh (including Bessemer, Homestead, Duquesne, Munhall), 99c; Portland, Oreg., 52c; Portsmouth, O., 51c.
St. Louis (including Federal, Granite City, E. St. Louis, Madison, Ill.), 51c; San Francisco (including So. San Francisco, Niles, Oakland), 66c; Seattle, 59c; Sharon, Pa., 75c; Sparrows Point, Md., 20c; Steubenville, O., 51c.
Warren, Pa., 75c; Weirton, W. Va., 70c.
Youngstown, 75c.

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt.	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	34.00
Mechanical Bundles	33.00
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	28.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Busheling	29.50
Bushelings new factory, prep'd.	33.00
Bushelings new factory, unprep'd.	28.00
Short Steel Turnings	28.00
Cast Iron Grades*	
No. 1 Machinery Cast	58.00-60.00

* F.o.b. shipping point.

mill scale

use:

Mill Scale is an iron oxide that forms in heat treating operations when the ingot is rolled down to blooms, slabs, etc. High in iron content, Mill Scale is a desirable scrap charge for the Blast Furnace where it is reduced to metallic iron. Coarse scale from heavy rolling mills is most desirable and is obtained by rushing the slab into the roughing stand where water under high pressure removes the scale. This scale is almost pure iron oxide and can be charged directly into the furnace. Fine scale from finishing mills should generally be sintered before charging. Mill Scale is also used in the production of wrought iron as it provides oxygen to eliminate certain unneeded elements present in the pig iron.

source:

Rolling mills, forge shops and other heat treating operations.

specifications:

Mill Scale. Iron oxide produced by heat treating operations; containing not less than 65% metallic iron.

This is one of a series illustrating the many and varied types of scrap required in the making of iron and steel for every use. Our national organization, manned by personnel who is steeped in every phase of scrap knowledge, is ready to meet your every scrap problem.

CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP

LURIA BROTHERS AND COMPANY, INC.

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READING, PENNA.
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MODENA, PENNA.
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BOSTON, MASS. Statler Building	CLEVELAND, OHIO 1022 Midland Bldg.	LEBANON, PENNA. Luria Building	PUEBLO, COLORADO 334 Colorado Bldg.
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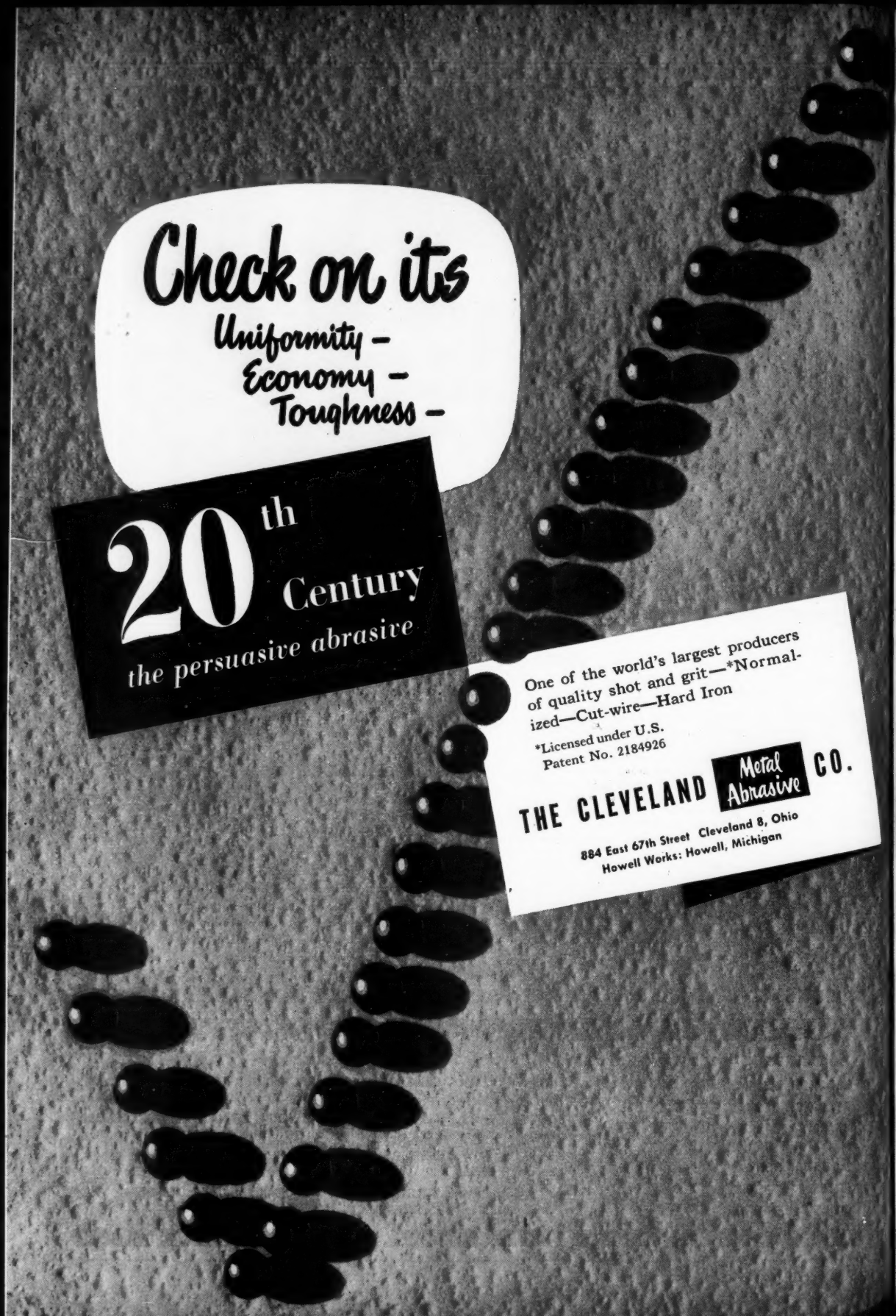
LEADERS IN IRON AND STEEL SCRAP SINCE 1889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Uniformity –
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the persuasive abrasive
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The Metal Market

Allocations of copper to foundries to start Oct. 1 as shortage is aggravated by strike of miners and mill workers. Shrinkage of red metal scrap also cuts copper supply

BEGINNING Oct. 1, allocations of copper raw materials to individual brass and bronze foundries will be based on historical patterns of consumption during 1950.

Foundries using less than 10,000 pounds of copper materials a month will apply for metal on form NPAF-83 for a six month period, Oct. 1, 1951, through March, 1952. They will be permitted to place monthly orders for one-sixth of the total quantity of material allotted over the six-month period.

Foundries using from 10,000 to 100,000 pounds will be allocated copper materials on a three-month basis. Authority will be granted to them to purchase one-third of their total allotments during each month of the three-month period.

Allocations will be made on a monthly basis to foundries using 100,000 to 2 million pounds of copper raw material a month (large minor foundries) and to foundries using 2 million pounds or more a month (large major foundries). About 80 per cent of the industry's total output is produced by these last two classes of foundries.

Supplies Cut—Work stoppages in the copper mining industry, as well as a shrinkage of supplies of copper and copper-base alloy scrap, have reduced drastically the supply of domestic copper. Although copper imports are still being received, a large percentage of these materials is in the form of ores, concentrates or blisters the processing of which has been hampered recently by plant shutdowns. Under normal conditions, the mine-to-market cycle consumes 90 to 120 days. Consumers will feel effects of the strike throughout the remainder of this year and can not expect full relief much before January, 1952.

Get ACM Order for Copper

Producers of copper controlled materials are prohibited from filling any orders after Oct. 1 other than authorized controlled material (ACM) orders. This restriction provides the final step in transition to a 100 per cent CMP operation in the fourth quarter, so far as copper is concerned. This action does not cancel the reservation of production to fill unrated orders which may be converted up to and including Sept. 10 by consumers who have received authorized CMP allotments. Conversion of an unrated order into an ACM order is permitted.

Producers having copper controlled material in actual process of production to fill orders other than ACM orders, which can not be shipped prior to Oct. 1, must divert that production to fill ACM orders wherever possible. Where diversion is not possible, the producer is directed to submit immediately to NPA a list of orders in that category, giving the names of purchasers affected, description of material orders, DO rating (if any) and probable shipping dates. Although shipment may not be made prior to Oct. 1, production on such orders should not be stopped except when specifically directed by NPA.

Brass Ingot Prices Decline

Prices declined 1.25 cents to 3.75 cents a pound, effective Sept. 4, on all brass and bronze ingots except alloys 193 to 242 in the 88-10-2 group. This action was taken to realign ingot prices with ceiling prices established on scrap materials. A large producer cut prices of all alloys in the 85-5-5-5 group 1.75 cents a pound. Ingots in the 88-10-2 group, with the exceptions noted above, were cut 1.25 cents to 3.50 cents. Alloys in the 80-10-10 group were cut 1.75 cents. Price reductions in the No. 1 yellow ingot group and in the nickel alloy group were cut 2 cents to 2.50 cents. Price for aluminum bronze alloy No. 415 dropped 3.75 cents, while prices of all manganese bronze ingots were cut 2.75 cents to 3.25 cents a pound. The price for silicon bronze ingot No. 500 was cut 3.75 cents. Producers anticipate an early improvement in the availability of scrap required in their operations.

Warehouses Get Relief

Distribution of brass mill products from warehouses will be improved. National Production authority issued order M-82 to assist distributors in maintaining inventories at workable levels.

A distributor of brass mill products may replace his inventory by using the allotment symbol "X6" to replace products by weight which were delivered in the preceding month to fill DO and authorized controlled material orders. If his inventory at the monthend is less than his average monthly inventory during the period Jan. 1, 1947, to June 30, 1950, the distributor may place an X6 order on a brass mill for 5 per cent of the difference. The total weight of all orders designated X6 placed in any one month can not, however, exceed 150 per cent of the average monthly weight of his base period deliveries.

A brass mill is not required to accept an X6 order from any distributor who was not a purchaser from the mill during the base period, or an X6 order for any item of brass mill products not purchased by him from the mill during the base period.

A distributor is not required to accept rated orders for any item in excess of 500 pounds or one-half of his inventory of that item, whichever is less, unless otherwise directed by NPA. He may not accept orders for more than 2000 pounds of any item.

Delivery of brass mill products by domestic brass mills may not be accepted by a distributor if his inventory would become larger than his average monthly base period inventory, or larger than a minimum practicable working inventory.

Operates Zirconium Plant

United States Bureau of Mines' northwest electro development laboratory in Albany, Oreg., has been converted into the world's largest producer of zirconium. Requirements of the Atomic Energy Commission and other demands for this metal are being met by an expansion program, involving buildings and facilities, at the pilot plant in that city. Two structures, one to house a purfication plant and the other consisting of an addition to the main plant, are nearing completion.

Canadian Aluminum Project

Aluminum Co. of Canada's new aluminum project at Kitimat, B. C., will have an initial production of 80,000 tons a year. McNeely Dubose, vice president, sets mid-1954 as the probable date for start of production.

Metals Firm Moves Plant

K. Hettleman & Sons Inc., Baltimore, dealer in scrap metals and manufacturer of brass and bronze ingots, acquired the former plant of Brooklyn Chemical Works Inc., Brooklyn, Md. Hettleman plans to transfer to these new quarters, containing about 150,000 square feet of floor space, around the first of next year. The company will utilize 60,000 square feet of space, holding the remainder for sale or lease. A considerable amount of new equipment is to be installed. The company's present plant, containing 40,000 square feet of floor space, will be either sold or leased.

Federated Builds in South

Federated Metals Division, American Smelting & Refining Co., New York, will start construction of a plant in Birmingham as soon as engineering details are completed. Products to be made in the new plant are brass and bronze ingots, aluminum and magnesium alloys, babbitt metals, solders, type metals, copper, zinc and lead anodes, zinc dust, magnesium anodes, die-casting metals, and lead products.

E. L. Newhouse Jr., vice president of Federated, expects the Birmingham plant will become an important link in the division's chain of nonferrous metal producing facilities.

American Smelting plans to construct an addition to its Corpus Christi, Tex., plant. This will result in added capacity of 2000 tons per month for production of special high grade zinc.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c. Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c; 88-10-2 (No. 215) 38.50c; 80-10-10 (No. 305) 32.25c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 17.50c; brass special 17.75c; intermediate 18.00c, East St. Louis; high grade 18.85c, delivered.

Lead: Common 16.80c; chemical 16.90c; corroding 16.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb. c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 18.00c; grade 2, 17.75c; grade 3, 17.25c; grade 4, 16.50c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 103.00.

Antimony: American 99-99.8% and over but not meeting specifications below 42.00c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 42.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York, $195-$200 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b., Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.55 del.; special or patented shapes $2.80.

Cobalt: 97.99%, $2.10 per lb for 500 lb (kegs); $2.12 per lb for 100 lb (case); $2.17 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 90.16c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill; effective Aug. 23, 1951)

Sheet: Copper 41.68; yellow brass 38.28; commercial bronze, 95% 41.61; 90% 41.13; red brass, 85% 40.14; 80% 39.67; best quality, 39.15; nickel silver, 18%, 53.14; phosphor-bronze grade A, 5%, 61.07.

Rod: Copper, hot-rolled 37.53; cold-drawn 38.78; yellow brass free cutting, 32.63; commercial bronze, 95%, 41.30; 90%, 40.82; red brass 85%, 39.83; 80%, 39.36.

Seamless Tubing: Copper 41.72; yellow brass 41.29; commercial bronze, 90%, 43.79; red brass, 85% 43.05.

Wire: Yellow brass 38.57; commercial bronze, 95%, 41.90; 90%, 41.42; red brass, 85%, 40.43; 80%, 39.96; best quality brass, 39.44.

(Base prices, effective Nov. 6, 1950)

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 28.67-30.295; l.c.l. 29.17-30.92; 100,000 lb lots 28.545-30.295; weatherproof, f.o.b. eastern mills, c.l. 30.10, l.c.l. 30.18, 100,000 lb lots 29.35; magnet, del., 15,000 lb or more 34.50, l.c.l. 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	—Round— R317-T4, 17S-T4	R317-T4	——Hexagonal—— 17S-T4
0.125	52.0	....	....
0.156-0.188	44.0	....	....
0.219-0.313	41.5	....	....
0.375	40.0	46.0	48.0
0.406	40.0	....	....
0.438	40.0	46.0	48.0
0.469	40.0	....	....
0.500	40.0	46.0	48.0
0.531	40.0	....	....
0.563	40.0	....	45.0
0.594	40.0	....	....
0.625	40.0	43.5	45.0
0.688	40.0	....	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	....	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	....	....
1.625	36.5	....	39.5
1.688-2.000	36.5	....	....

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $22.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $22.00 per cwt. Traps and bends: List prices plus 60%.

ZINC

Sheets, 24.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 23.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 23.50-24.50c; over 12-in., 23.50-24.50c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads, 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb, 75.50c; 3000 to 10,000 lb, 76.50c, 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 400 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 400 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 77.7c; 100 or 350 lb drums only, 100 to 600 lb, 63.1c; 700 to 1900 lb, 60.6c; 2000 to 9900 lb, 58.9c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.19; 500 to 999 lb, $1.195; 200 to 499 lb, $1.20; less than 200 lb, $1.215. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 47.7c, 10 or more drums, 45.7c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.0009; more than 2000 lb, 98.09c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, 87.23c; 100 lb kegs 88.23c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.625
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group I: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material.

Group II: No. 1 soft red brass solids 19.50; No. 1 composition borings 19.25 per lb of Cu content plus 83 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 78 cents per lb of tin content; unlined red car boxes 19.25; lined red car boxes 18.25; cocks and faucets 16.75; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Zinc Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment)

Unsweated zinc dross, 12.25c; new clippings and trimmings, 14.50; engravers' and lithographers' plates, 14.50c; die cast slabs, min. 90% zinc, 12.25; old zinc scrap, 11.25c; forming and stamping dies, 11.25; new die cast scrap, 10.75; old zinc die cast radiator grills, 10.50; old die cast scrap, 9.50c.

Lead Scrap Ceiling Prices

(F.o.b. point of shipment)

Battery lead plates, 17.00c per lb of lead and antimony content, less smelting charge of 2 cents per lb of material in lots 15,000 lb or more; less 2.25c in lots less than 15,000 lb. Used storage batteries (in boxes) drained of liquid, 6.60c for 15,000 lb or more; 6.40c for less than 15,000 lb. Soft lead scrap, hard lead scrap, battery slugs, cable lead scrap or lead content of lead-covered cable scrap, 15.25c per lb. In addition, brokerage commissions are permitted.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50, high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50; Mixed plant scrap: Copper-free solids, 10.00 dural type, 9.00; Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DAILY PRICE RECORD

1951	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Sept. 1-6	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
Aug. 1-31	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
Aug. Avg.	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
July Avg.	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16
June Avg.	24.50	16.80	17.50	117.962	19.00	42.00	56.50	88.492
May Avg.	24.50	16.80	17.50	139.923	19.00	42.00	50.50	90.16
Apr. Avg.	24.50	16.80	17.50	145.735	19.00	42.00	50.50	90.16
Mar. Avg.	24.50	16.80	17.50	145.730	19.00	42.00	50.50	90.16
Feb. Avg.	24.50	16.80	17.50	182.716	19.00	42.00	50.50	90.16
Jan. Avg.	24.50	16.80	17.50	171.798	19.00	35.462	50.50	88.890

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

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Approximately 175 TONS SURPLUS STOCK

B&W STAINLESS STEEL TUBING

SEAMLESS AND WELDED

Following grades and size ranges included in this lot. (All this material is subject to prior sale.)

B&W GRADE	AISI GRADE	TYPE*	O.D. RANGE		WALL RANGE	
Croloy 18-8	302	S	2.467	3.156	.336	.428
		W	1.000	2.000	.035	.065
Croloy 18-8 Si	302B (Mod)	S	2.375	3.250	.180	.218
Croloy 18-8 FM	303 (Mod)	S	1.125	2.625	.188	.250
Croloy 18-8 S	304	S	.625	5.563	.035	.750
		W	1.000	4.500	.035	.180
Croloy 25-12	309 S	W	1.050	4.000	.065	.140
Croloy 25-12 Cb	309 Cb	S	1.315	1.500	.133	.250
		W	1.050	1.315	.049	.133
Croloy 25-12 CbTa	309 CbTa	W	1.000	3.500	.109	.154
Croloy 25-20	310	S	1.000	3.125	.035	.340
		W	1.313	2.750	.083	.154
Croloy 16-13-3	316	S	.750	5.000	.039	.375
		W	1.000	4.500	.042	.154
Croloy 16-13-3 Cb	316 Cb	S	1.050	3.000	.062	.520
Croloy 18-13-3	317	S	.625	2.625	.049	.382
		W	1.000	4.000	.065	.145
Croloy 18-8 Ti	321	S	1.000	5.118	.035	.687
		W	1.250	2.875	.060	.125
Croloy 18-8 Cb	347	S	.688	6.625	.032	.680
		W	1.000	4.500	.035	.154
Croloy 18-8 CbTa	347 Ta	S	1.050	3.375	.065	.562
Croloy 12 A1	405	S	1.000	6.500	.065	.635
Croloy 12	410	S	1.000	3.250	.035	.563
		W	3.000	4.166	.083	.109
Croloy 12-½ Mo.	410 (Mod)	S	1.050	2.875	.148	.313
Croloy 12-2	414	S	1.770	4.000	.232	.382
Croloy 18	430	S	1.000	5.000	.035	.296
		W	1.125	2.250	.049	.145
Croloy 22	443	S	2.375	3.250	.188	.250
Croloy 27	446	S	.813	6.625	.035	.400
19-9 D L		W	2.250	2.500	.050	.065

* S—Seamless W—Welded

A list of actual material included in this lot is available on request.†

This stock is surplus material and covers overages, short lengths, etc. produced against orders for mechanical and pressure tubing involving a number of different specifications and grades. Because of the number of specifications and grades involved, the dimensional tolerances, surface finish and mechanical properties vary. It is highly desirable to incorporate in your inquiry or order the details of standards and chemistries which will be acceptable to you. If this is done, it will enable B&W to do a better job of handling your requirements.

†Please address orders or inquiries for any of this material to the nearest B&W Tube Company District Sales Office.

Beaver Falls, Pa. ..... 712 Eleventh Street
Boston 16, Mass. ..... 250 Boylston Street
Chicago 3, Ill. ..... 105 South LaSalle Street
Cleveland 14, Ohio ..... 629 Euclid Avenue
Denver 1, Colo. ..... P. O. Box 1108
Detroit 26, Mich. ..... 1717 Ford Building
Houston 2, Texas ..... Bankers Mortgage Building
Los Angeles 17, Calif. ..... 1111 Wilshire Blvd.
New York 16, N. Y. ..... 22 East 40th Street
Philadelphia 2, Pa. ..... Packard Building
San Francisco 3, Calif. ..... Humboldt Bank Bldg.
St. Louis 1, Mo. ..... Paul Brown Building
Syracuse 2, N. Y. ..... 109 S. Warren Street
Tulsa 3, Okla. ..... Philtower Building
Toronto, Ontario, Canada ..... 159 Bay Street

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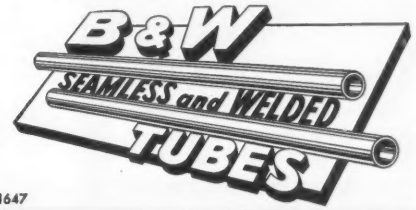
Executive Offices: Beaver Falls, Pa.
General Offices & Plants
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing



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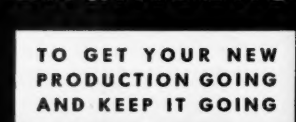

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INQUIRIES PROMPTLY ANSWERED

Sheets, Strip . . .

Sheet and Strip Prices, Page 157 & 158

Chicago—Demand for light flat-rolled products exceeds supply but inquiries have lessened. Easing in pressure for carbon sheets has pushed down the price for gray market material. Where sheets were commanding 22 to 24 cents a pound not so long ago in the gray market they now are reported available at 12 cents, and in some instances as low as 8 cents. Also indicative of the slightly easier demand for sheet and strip is a report that consumers who can't find a place to "cash" their CMP tickets for fourth quarter are not complaining about the delay they're encountering but are exhibiting only an irritation over CMP. Absence of complaints over delays suggests inventories of sheet and strip are good. Tightest of all light flat-rolled products is galvanized sheets, producers not only being crimped by government restrictions on zinc consumption but being unable to get deliveries of as much zinc as government regulations allow. Silicon sheet and strip for fractional horsepower motors is in lighter demand but for heavy motors it continues strong. One steel producer will open books in the next two or three weeks for selective acceptance of orders for first-quarter delivery of light flat-rolled products.

New York—Sheet sellers are in receipt of a heavy volume of orders for shipment after turn of the year. Some of these orders are for shipment as late as third quarter. However, except for certain military requirements most sellers are rejecting orders for beyond first quarter and very few for even that period. Meanwhile orders are still coming through for fourth quarter of this year but as all mills are booked up solidly on all major items little is being accepted. Certain producers can enter a little business in straight chrome grades but that is all. However, it appears allotments to a number of federal agencies will be well below stated requirements and where these allotments run less than orders already entered on mill books, some cancellations for fourth quarter may yet develop.

Boston—By December, possibly before with some cold-rolled strip producers, more normal customer relationships will be established by the mills. Most converters will lead integrated mills in this respect. Pressure for carbon flat-rolled is easing. Some old unrated delinquent orders have been dropped. Direct armament buying is heavier. Springfield armory has quotations on 2840 tons of steel cartridge clips and placed 233 tons of special strip with Wallingford Steel Co. and 135 tons with Firth Sterling Steel & Carbide Corp., McKeesport, Pa.

Philadelphia—Demand for coated sheets and hot-rolled carbon sheets is outstanding. Producers have nothing left for this quarter, unless cancellations should later develop, and are booking little for shipment beyond.

Pittsburgh—NPA revision of basic steel order M-1 allowing producers to accept orders from regular customers after military needs are assured has resulted in some limited rearrangement of fourth quarter sched-

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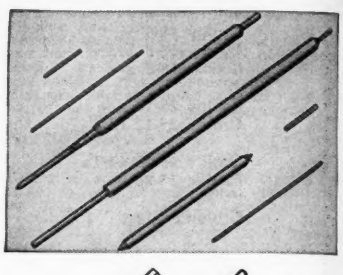

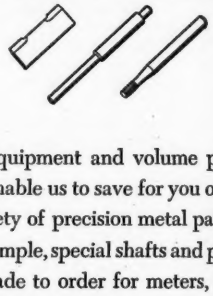

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ules in an attempt to aid established customers as soon as possible. Most customers will not realize the benefit of the NPA ruling until first quarter 1952, however. Carryovers will be a serious problem into 1952.

Cleveland—Sheetmakers are under pressure from consumers for shipments but the supply stringency in the flat-rolled products appears less acute than in shapes, plates and bars. The reason for this is that consumer durable goods manufacturers have been forced to cut their production schedules and consequently are not pressing for tonnage like they were a few months back. Still, output of the mills continues to fall short of demands.

Steel Bars . . .

Bar Prices, Page 157

Cleveland—Tight bar supply will be encountered through fourth quarter. Substantial monthly carryover is expected by the mills all through the period. This will necessitate monthly adjustments in rolling schedules with attendant delays in shipments. Extent to which uncovered CMP tonnage for fourth quarter will be taken up by the mills depends on the volume of cancellations that are received.

Chicago—Hot-rolled carbon bars continue in extremely strong demand. Contributing to this demand are requirements of cold finishers, who are trying to fill astronomical-size orders for cold-finished bars for projectile shells and fuses and other defense items. Even though NPA regulations provide cold finishers a monthly supply of hot-rolled stock equal to at least 110 per cent of their base period monthly average usage, they find this is not enough. One mill doing conversion work still can take bookings for hot-rolled bars, provided billets are supplied.

Boston—While bar mills are booked through fourth quarter on most carbon grades, some volume in stainless for December is open, although this tonnage is being taken up rapidly. Deferments and cancellations are appearing from anti-friction bearing shops. Screw machine and forging shops are taking full allocations. Watertown arsenal is inquiring for substantial quantities of forgings.

Philadelphia—Due in part to heavy arrearages, some leading bar sellers have not as yet been able to set up fourth quarter schedules with any assurances they will stick.

Pittsburgh—Bars, all types, will be in short supply into next year. Convertors of hot bars to cold-finished are in much better position due to the NPA guarantee of 110 per cent base period receipts for first and second quarters 1952. This ruling does not solve their immeidate supply problem and the convertors will have difficulty throughout fourth quarter.

Seattle—Bar mills hold substantial order backlogs and they are turning away considerable prompt shipment business. However, some capacity is open for quick shipment tonnage on national emergency account. Northwest Steel Rolling Mills is operating two shifts, five days weekly. About 2000 tons of reinforcing bars for public works projects are pending.

Plates . . .

Plate Prices, Page 157

New York—Plate sellers generally are restricting new bookings for next year largely to the first quarter and even then principally to military directives. Some cancellations on tonnage scheduled before end of this year may develop, however, thus providing for the insertion of some new tonnage. But, in any event, cancellations should not have much effect before late in fourth quarter. Of particular interest to plate makers is word from Washington that the Defense Transport Administration will receive allotment for fourth quarter for only 30,000 tons as against stated requirements of 104,553 tons and that the Petroleum Administration for Defense will receive an allotment of 60,000 tons against 102,123 tons.

Philadelphia—Central Iron & Steel Co., Harrisburg, Pa., has advanced its price on carbon plates from 4.95c to 6.75c Harrisburg, effective Sept. 1. This is an increase of $36 a ton.

Boston—Plate fabricating shops with few exceptions consider fourth quarter allotments too low to meet requirements, most in some way connected with defense. Some consumers, including weldment fabricators, are seeking restoration of tonnage more in line with pre-CMP pattern. Business with small tank builders is holding well while shipyard backlogs are growing.

Pittsburgh—On the basis of present fourth quarter commitments plate producers will have carryovers beyond Jan. 1. Pressure will increase in fourth quarter from carryover from third quarter. Required minimum bookings by producers were figured on the basis of a fully productive month with no percentage allowance made for carryover, mill delay or strikes.

Fabricators report relatively good deliveries but building inquiries are increasing and backlog of construction is heavy. Inquiries are usually in step with defense plant expansion. Builders of inland waterway barges requested larger allocations of plates for first quarter 1952. They are allotted 80,000 tons for fourth quarter and seek an additional 33,000 tons.

Seattle—Fuel storage at McChord air field and a tank farm for Monsanto Chemical Co. here involve unstated tonnages of plates. Inadequate supply of steel is handicapping fabricators. Some fourth quarter allotments have been received. American Pipe & Construction Co. is fabricating 568 steel pots, heavy plate 20x9x3 ft each, for Alcoa's new plant near Wenatchee, Wash.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 157

Boston — Orders placed for 6000 tons reduces unplaced concrete reinforcing bar volume, but substantial tonnages still pend for housing and bridges. Contracts include 3200 tons, Providence, R. I., housing. Starting Oct. 1 fabricated reinforcing bars will be classified as CMP class "A" products with code number 34415. Fabricators must obtain allotments from the customer if scheduled for delivery after Sept. 30.

Los Angeles—Drastic increases in federal building bans coupled with heavier military and naval construction spurred valuation of construction in southern California in July to $154,322,806, 23 per cent higher than in June, and second highest level in the district's history.

Wire . . .

Wire Prices, Page 159

Boston—Volume of wire orders is more uneven as to products. While some equipment is overloaded, other departments could handle more tonnage. There are openings for fourth quarter, even October, on some carbon products and alloy bookings are spotty. At least eight mills, one in New England, are increasing capacity for .015 diameter stainless wire under government contract.

Structural Shapes . . .

Structural Shape Prices, Page 157

Chicago — Demand for structural shapes far outstrips supply. All sizes and shapes are booked up through rest of the year and there is considerable inquiry for next year. However, one mill still can take bookings for rolling small structurals from billets. Complaint over the insufficiency of structurals and other steel used for bridges and highways is voiced by Frank N. Barker, chief state highway engineer of Illinois. He says initial allotment of steel for Illinois for the first quarter of 1952 is 40 per cent of that for fourth quarter 1951. This would be 4597 tons, 2149 of which may be used for bridges.

Boston—Fabricating shops with orders for defense plant expansion are likely to get most plain material needed for fourth quarter, but status of many other projects, including bridges is in doubt. Cutbacks are aimed to ease the overload on structural mills and result in some schedule revisions by fabricating shops. Latter are pacing operations to availability of plain material and could turn out more tonnage if steel could be obtained.

New York—Sharp curtailment of steel for construction not tied in directly with military production in fourth quarter is expected to result in revisions of schedules at fabricating shops. Tonnage available for the steel expansion program in the period is to be sliced by almost half, according to word from Washington. The aluminum expansion program appears to be the only exception in the general cutback.

Philadelphia—Structural activity is confined principally to bridge work, with awards relatively light in the aggregate. Restriction in the amount of steel available in fourth quarter for various industrial expansion programs is expected to result in readjustments in fabricating shop schedules. Some shops may be forced to curtail sharply after end of October.

Pittsburgh — Demand pressure is expected to mount throughout fourth quarter. Over-validation will account for increasing carryovers each remaining month this year. Proper governmental handling can reduce confusion created by this carryover conditon but no matter what action is

taken its effect won't be felt until first quarter 1952. Producers here are booked to capacity.

Cleveland—Extent to which industrial construction in this area will be cut back as result of reduction in allocations of structural steel because of the acute shortage is uncertain. Even jobs that are pretty well along are expected to be delayed. This includes much steel plant expansion in the immediate Cleveland district, which, it is understood, is well advanced.

There is little prospect that supply conditions in structurals will materially improve for months to come. At the current rate of shape production, 400,000 to 425,000 tons monthly, there just isn't enough to meet all demands.

Seattle—Fabricators, holding heavy order backlogs, are not interested in immediate future shipment business. However, they are receptive with respect to 1952 orders. Meanwh le, industrial expansion is absorbing a large tonnage of available steel.

Tubular Goods . . .

Tubular Goods Prices, Page 161

Boston—Indications are merchant steel pipe dsitributors will continue to take full allotments for November. Several utilities are having trouble getting requirements for gas line extensions. Seamless and tubing specialties are sold far in advance. Union Hardware Co., Torrington, Conn., booked 367,000 feet of steel tubing for Springfield armory.

Pig Iron . . .

Pig Iron Prices, Page 156

Cleveland—Merchant pig iron sellers anticipate gradual increase in consumer pressure for tonnage as the fall advances. Steady increase in defense castings requirements is expected from here on to offset slackening attending curtailment in consumer durable goods. At the same time, resumption of foundry schedules following vacation shutdowns is expected to bring out renewed demands from melters that have been more or less quiescent in recent weeks. However, the foundries can look for little additional iron with output of the furnaces fully committed. In fact, closing down of one merchant stack in this immediate district will contribute to the stringency since customers of this furnace have been unable to build inventories to tide them over the period of shutdown.

Boston—Pressure for pig iron is easing and the melt has not recovered from earlier slackening. Volume is down with more jobbing foundries, textile equipment builders and a few others. Consumption of malleable is heavier than for foundry grade. Most customers of Mystic Furnace, nearly 100 per cent, indicate they will renew contractural agreements with that furnace. Some consumers not operating under the plan currently have expressed a desire to join when the matter comes up in midyear 1952.

New York—While some gray iron foundries' business is spotty momentarily, they are interested in all the pig iron they can get—at least short of paying premium prices for foreign iron. They anticipate better demand for castings as the fall gets under way.

Buffalo—The acute supply situation in merchant pig iron became more serious when a leading producer here was forced to shut down its largest furnace for relining and general rehabilitation. The furnace, a 700-ton producer, has been in action for more than six years. High grade Swedish ore is again moving into the area via the St. Lawrence river from Canada.

Philadelphia — While basic consumers are pressing hard for tonnage, pig iron sellers say demand for foundry grades is less pressing. However, this situation is believed temporary.

Pittsburgh—Demand pressure for pig iron is increasing. Foundry and steel plant operations are up slightly with vacations ended. At present 52 of 54 district blast furnaces are operating. One stack at National Tube Co.'s McKeesport Works underwent minor repairs last week and was quickly returned to full operation.

Chicago—Demand for merchant pig iron has eased but it still exceeds supply. Easing stems from production cutbacks by some foundries, largely captive ones, working on orders for the automobile and farm implement industries.

Ferroalloys . . .

Ferroalloy Prices, Page 163

Washington — Domestic production of silicon and all grades of silicon alloys, totaled 219,724 net tons in second quarter 1951, decline of 9 per cent from first quarter. Of the total, blast furnace output of silvery pig iron was 45,598 tons, 21 per cent of total production; electric furnace production increased to 149,944 tons, or 68 per cent of the total; the remaining 24,182 tons, or 11 per cent, consisted of silicon metal, silicon briquets, and miscellaneous silicon alloys.

Shipments amounted to 233,651 tons in second quarter compared with 224,945 tons in first quarter. Apparent consumption of silicon alloys increased to 239,750 tons in second quarter against 234,465 tons in the first three months this year, gain of 2 per cent.

Tin Plate . . .

Tin Plate Prices, Page 158

Washington — Task group will be appointed by the National Production Authority to develop industry-wide classifications of secondary tin mill products. The industry committee has asked that unmended menders, tin and terne waste-waste, and black plate rejects, be considered controlled materials, and that tin plate strips, lithographed misprints, black plate wasters, cobbles, resorted tin and terne waste-waste be decontrolled.

Requests also were made to increase the 12,500 tons of tin mill secondaries reserved for export during fourth quarter. It also was recommended by the committee that a study be undertaken to determine the extent of jobbers' inventories of secondaries. These are reported large.

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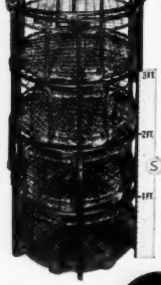

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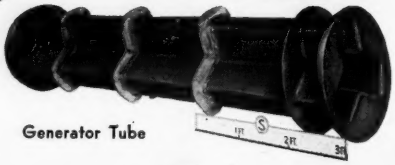

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Iron Ore . . .

Iron Ore Prices, Page 163

Cleveland—Shipments of Lake Superior iron ore declined to 2,770,483 tons during the week ended Sept. 3 from 3,008,179 tons the preceding week. This was due to stormy weather on Lakes Superior and Huron. The cumulative total for the season to 7 a.m., Sept. 3, is 59,851,788 tons compared with 47,789,281 for the like period a year ago, a gain of 12,062,507 tons.

The three 647-foot iron ore carriers being built for Pittsburgh Steamship Co. will be named the *Philip R. Clarke, Arthur M. Anderson,* and *Cason J. Callaway.* Scheduled for launching toward the end of 1951, the vessels will add 2.2 million tons a year to the iron ore carrying capacity of this United States Steel subsidiary's 61-vessel fleet.

The 666-foot self-unloading limestone carrier, being built for Bradley Transportation Co., will be named *John G. Munson.* It will have a carrying capacity of 20,000 gross tons of stone.

Scrap . . .

Scrap Prices, Page 164

New York—Scrap brokers are under heavy pressure for the steel grades, but report demand for cast scrap is not too active. Some iron foundries have moderate stocks. Moreover, they report business as spotty. Collections of cast grades are a little freer.

Philadelphia—District consumers of open-hearth scrap have not been able to build up inventories to any extent, if at all. At the same time they have not had to curtail production because of lack of scrap.

Pittsburgh—Allocations account for almost the entire scrap movement here. Dearth of scrap creates alarm in operating circles as increased defense demands are expected over the winter. Main hope is that the mission in Korea will be able to turn up quantities of battlefield scrap. Expected yield from Korea is 300,000 tons while India it is hoped will offer about 250,000 tons. Pacific islands will be visited in the quest for scrap.

Buffalo—Efforts to build reserve scrap stocks were jolted severely last week as dealers throughout the area were shipping to two Ohio distress points under government allocation.

Detroit—Members of this area's scrap mobilization committee met last Thursday to evaluate progress of the drive and discuss future action. Traders believe scrap collection must be stepped up to prevent a famine while Detroit plants are in the transition period. Meanwhile, mills have been able to maintain operations at high levels, having more and more help through directed scrap receipts.

Cleveland—Representatives of National Production Authority from Washington were investigating the scrap situation in Ohio last week. Spot checks were made at dealers' yards as well as mills to determine the actual supply as compared to requirements. Movement of industrial scrap is slower, but trade interests expect a gradual gain in momentum as the season advances. Some foundries are in dire need of scrap, although the overall situation in this industry has improved slightly.

Cincinnati—Temporary relief of the dire scrap shortage of Armco at Middletown was gained through allocations. The question of a steady flow in volume to support capacity melt remains unsolved, and is especially grave in looking forward to winter.

Chicago—Shipment of "super-allocation" scrap of steelmaking grades to Armco Steel Corp.'s Middletown, O., works is leaving practically no "free" scrap in the Chicago district. Demand for open-hearth and electric furnace grades far exceeds supply. Blast furnace grades also find a ready market. Calls for cast grades have eased somewhat, due to slackening in foundry activity.

Seattle—Competition for available supplies of steel scrap is intense. Receipts cover consumption but inventories are not being replenished. Buyers believe the government should assist in scrap collection in remote areas where costs and shipping charges are high. Alaska railroad has called tenders for 5000 tons and the Puget Sound Navy yard is moving its scrap quickly. Buyers state there is considerable tonnage remaining in the Aleutians but costs of bringing it to furnace are prohibitive under present price ceilings.

Chrome Ore . . .

Washington—Chrome ore and concentrates have been added to the government's long-range purchasing program designed to encourage development and production of critical metals. Depot has been established at Grants Pass, Oreg., to which miners and producers may ship chrome for inspection and purchase.

General Services Administration's program calls for purchase of up to 200,000 tons of specification chrome ore concentrates of domestic origin by June 30, 1955. Under the regulation, five tons of ore will be the minimum shipment accepted and no more than 2000 tons a year will be accepted from any one source without prior written approval of the government.

Prices paid will depend on the chromic oxide content of the ore as well as the ratio of chromium to iron. The base price for lumpy ore is $115 per ton and for fines and concentrates $110.

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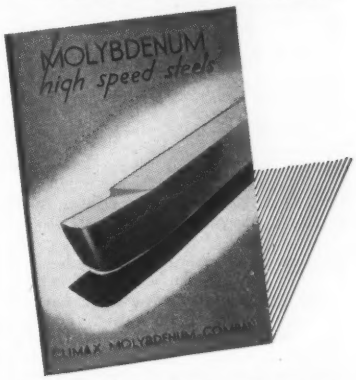

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Warehouse . . .

Warehouse Prices, Page 163

Cleveland—Steel distributors anticipate increasing stringency in supplies of the major products over remaining months of the year. Drying up of the area of "free" supplies cuts off a source of substantial tonnage for the warehouses. Their receipts from the mills, scheduled over last quarter at 85 per cent of their base period tonnage, are expected to fall short of demands by a wide margin in most items. Increase in warehouse receipts of carbon steel products to 100 per cent of the base period tonnage is not likely to go into effect before first quarter. This is a keen disappointment to distributors since the increase was originally scheduled to become effective with fourth quarter. Some foreign steel continues to be received at Great Lakes ports and this tonnage is helping relieve the shortage to some extent.

Philadelphia—A slight falling off in business this month due to the Labor Day holiday and the fact that September is a shorter month is expected by warehousemen.

Chicago — Shifting of demand at warehouses is noted. From some types of consumers demand is softer, while from others it is stronger. Net effect is that overall warehouse volume is as heavy as ever. Distributors could sell three times as much steel as they are allotted under government regulations.

San Francisco—Slight softening in demand for specialty steels is noted. Otherwise business continues brisk.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 161

Pittsburgh—Most foundries and steel plants have sufficient inventories of oven coke and the market is quiet and slow. Beehive foundry shipments to other consuming areas make up the major part of movement in that grade.

Chicago—Metallurgical coke which has been in easy supply, is in slightly less demand, largely because of production cutbacks by some foundries. Coke deliveries can be had immediately. Quality is good.

Canada . . .

Hamilton, Ont.—New blast furnace of the Dominion Foundries & Steel Ltd., here has been blown in. The company is the fourth steel producer in Canada to make its own pig iron.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

6000 tons, including plates, axles, etc., refrigerator cars, to Pacific Car & Foundry Co., Penton, Wash., to various producers.

1750 tons, state highway bridge, Union county, New Jersey, through Franklin Construction Co., Newark, N. J., general contractor, to Harris Structural Steel Co., New York.

925 tons, state bridgework, Cumberland and York counties, Pennsylvania, to Bethlehem Steel Co.

100 tons, Hartford Park housing project, Providence, R. I., to Providence Iron & Steel Co., Providence; E. Turgeon Construction Co. Inc., Providence, general contractor.

Unstated, government-furnished, 133-foot steel span for Alaska Railroad; general contract to Munter Construction Co., Seattle.

STRUCTURAL STEEL PENDING

2800 tons, hangar, Boeing Airplane Co., Seattle; plans in preparation.

2780 tons, Russell Street viaduct, Municipal Department of Public Works, Baltimore, bids Sept. 13; also 500 tons reinforcing steel, 8700 linear feet of steel H piles, and 18,700 linear feet of pipe piling.

1080 tons, junior high school, Bronx, New York; Colmar Construction Co., Brooklyn, low on general contract.

400 tons, jig erection building for Boeing Airplane Co., Seattle; general contract to Austin Co., Seattle.

150 tons, station alterations, Pennsylvania Railroad, Camden, N. J.; bids to be closed shortly.

150 tons, artillery and fire control building, Army, Aberdeen, Md.; bids Sept. 11.

REINFORCING BARS . . .

REINFORCING BARS PLACED

2500 tons, Hartford Park housing project, Providence, R. I., to Plantations Steel Co., Providence; E. Turgeon Construction Co. Inc., Providence, general contractor.

2000 tons, forge-press building, Wyman-Gordon Co., North Grafton, Mass., to United States Steel Supply Co., Cambridge, Mass.; Gilbane Construction Co., Providence, R. I., general contractor.

1235 tons, outside utilities, Eielson air base, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; Lytle-Green, S. Birch & Son, and J. C. Boespflug Construction Co., joint low on general contract, $3,492,460.

725 tons, substructure, bridge, Merrimac river, Amesbury-Newburyport, Mass., to Bethlehem Steel Co.; Merritt-Chapman-Scott Corp., Boston, general contractor.

500 tons, warehouse, Western Electric Co., Seattle, to Northwest Steel Rolling Mills Inc., Seattle; general contract to J. C. Boespflug Construction Co., Seattle.

170 tons, Rock Island dam and Columbia Basin project, to Bethlehem Pacific Coast Steel Corp., Seattle.

160 tons, apartment building, Fairbanks, Alaska, to Inland Empire Steel Co., Seattle; S. S. Mullen, Seattle, general contractor.

REINFORCING BARS PENDING

150 tons, laterals Potholes canal, Columbia Basin project; bids, four schedules, to Bureau of Reclamation, Ephrata, Wash., Sept. 19.

Unstated, approaches White Salmon bridge, Columbia river; Natt McDougall Co., Portland, Oreg., low $83,905, to Port of Hood River, Oregon.

PLATES . . .

PLATES PENDING

Unstated, two tank farms and plant tanks, vanillin plant, Seattle, for Monsanto Chemical Co., Seattle; preliminary construction contract awarded E. F. Schuck Co., Seattle.

PIPE . . .

STEEL PIPE PENDING

Unstated, 2745 feet, 18 and 16 inch, system improvements; bids to Roy B. Hatmaker, city clerk, Leavenworth, Wash., Sept. 10.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Atlanta & St. Andrews Bay, two 1500-hp diesel-electric locomotive units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

Toledo, Peoria & Western, two 1500-hp. diesel-electric road-switcher units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

LOCOMOTIVES PENDING

Long Island Railroad, 12 diesel locomotives; trustee seeking court permission for purchase; also permission for purchase of 20 passenger cars.

RAILROAD CARS PLACED

Western Fruit Express, 300 refrigerator cars, to Pacific Car & Foundry Co., Seattle.

Burlington, 100 refrigerator cars, to Pacific Car & Foundry Co., Penton, Wash.

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705 Milam St., Phone 4-2641

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Ambassador 2-6700

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CLEVELAND, Ohio
Nottingham Steel Company
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Delta Distributors, Inc.
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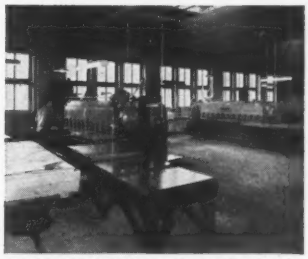

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Metalworking Briefs . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Budd Orders Heat Treat Line

Contract for the construction of a complete heat treat line for the production of rocket heads was awarded to Loftus Engineering Corp., Pittsburgh, by Budd Co., Philadelphia. The new line will heat treat 150 units an hour.

Clearing Machine Buys Plant

Clearing Machine Corp., press manufacturer, Chicago, purchased a plant in Hamilton, O., from Liberty Planers Inc., division of Hamilton-Thomas Corp., that city. The new plant will take the place of one Clearing had proposed to build in Joliet, Ill.

Barnes-Shasta Pump Co.

Shasta Pump Co., Oakland, Calif., merged with Barnes Mfg. Co., Mansfield, O. The new firm, Barnes-Shasta Pump Co., will be directed by J. E. Piccardo, the operating vice president.

Ingersoll-Rand Moves Branch

Ingersoll-Rand Co., New York, moved its Cleveland office to 4506 Chester Ave. More adequate office and warehouse facilities are provided at the new location.

Aetna-Standard Moves Office

Executive and sales offices of Aetna-Standard Engineering Co. are now located in the Frick Bldg., Pittsburgh. Engineering, accounting and purchasing offices are located in the company's new office building located in Ellwood City, Pa.

Boosts Annealing Capacity

Calstrip Steel Corp., Los Angeles, producer of cold-rolled strip, completed a building to house five annealing furnaces which increases the firm's annealing capacity by 42 per cent.

Delco Expands in Rochester

General Motors Corp., Detroit, plans an initial expenditure of $2,310,000 on expansion of its Delco Appliance Division, Rochester, N. Y.

Bell Aircraft Boosts Output

Bell Aircraft Corp., Buffalo, is preparing for production of guided missiles on a large scale in its Niagara Falls, N. Y., plant. Present facilities for the manufacture of jet-engine nacelles will be moved to the firm's Buffalo plant, making space available for the guided missiles program. Bell also is expanding its facilities for the manufacture of precision gears for its products.

De Laval Expands on Coast

De Laval Steam Turbine Co., Trenton, N. J., completed a building at 160 Folsom St., San Francisco, and will establish its San Francisco headquarters for sales and service in the structure. It will provide increased warehousing facilities for pumps, speed reducers and flexible couplings. C. F. Reeves is in charge of De-Laval's West Coast sales.

Alofs Mfg. Co. Moves

Alofs Mfg. Co.—pressed steel goods, dies, stampings and contract manufacturing—moved its offices and factory to 345 32nd St. S.W., Grand Rapids 8, Mich.

Neomatic Doubles Capacity

Neomatic Inc., Los Angeles, doubled its capacity for production of subminiature relays by moving to a larger plant at 11632 San Vicente Blvd.

Ceramic Coated Exhausts

Ryan Aeronautical Co., San Diego, Calif., announced the nation's first volume production contracts for adaptation of an ancient art to modern aircraft—ceramic coating of exhaust systems to conserve increasingly scarce strategic alloys.

Plans $7 Million Plant

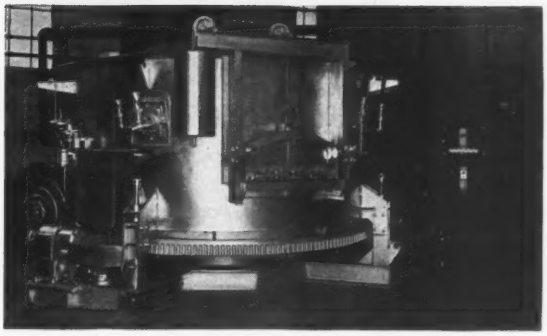
Davison Chemical Corp., Baltimore, will erect a $7 million catalyst plant six miles south of Lake Charles, La. Present schedule calls for operation of the plant early in 1953.

Erects Plant in Canada

Canadian Westinghouse Co. Ltd., Toronto, Ont., is erecting a plant in Hamilton, Ont., which will provide employment for about 1000 workers when it is completed in 1952.

Schedules Plant Opening

Formal opening in October has been scheduled by National Radiator Co., Johnstown, Pa., of its $1,250,000 plant at Duncansville, Pa. Production of boiler jackets, convectors and convector enclosures, baseboard radiation, and other sheet metal items may be started prior to the dedication and opening ceremonies, says Robert S. Waters, president. Nearly $400,000 worth of new machinery and equipment is



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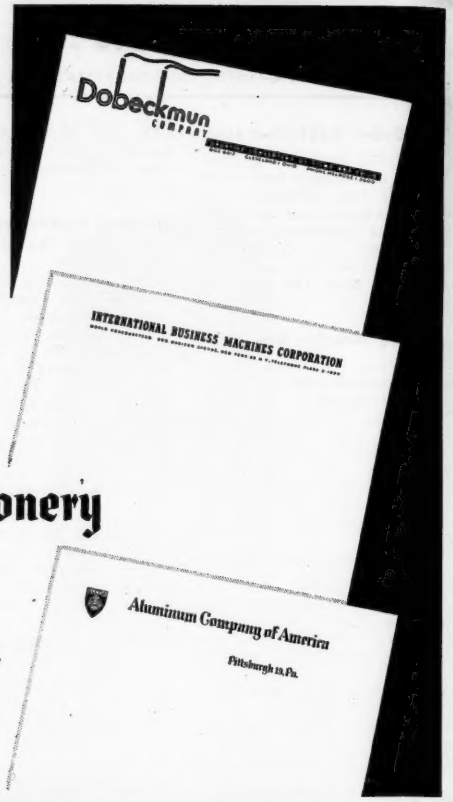

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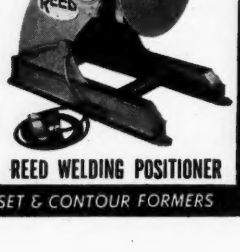

WRITE FOR BULLETIN 79

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being installed, in addition to a variety of presses, shears, press brakes, grinders, welding units and miscellaneous equipment which will be moved from other National Radiator plants.

Fruehauf Builds in Brazil

A new company to assemble and manufacture in Brazil all kinds of trailers and trailer bodies was organized by Roy Fruehauf, president, Fruehauf Trailer Co., Detroit. The organization, Fruehauf Trailer S.A., Industria e Comercio, will have headquarters in Sao Paulo, Brazil. Dr. Ary F. Torres is director-president of the new organization, while L. C. Burnett is managing director.

Buys Kitchen Cabinet Firm

American Radiator & Standard Sanitary Corp., Pittsburgh, purchased Acme Metal Products Corp., Blue Island, Ill. Acme, producer of kitchen cabinets in that city and in Dover, N. J., will be operated as a wholly-owned subsidiary and will retain its present name.

Kone Engineering Co. Moves

Kone Engineering Co., repairer of boiler plant instruments, moved into larger quarters at 5615 York Rd., Govans, Baltimore.

Quirino Buys Pipe Plant

California Pipe & Fitting Co., Taft, Calif., was sold to Antonio Quirino, brother of President Elpidio Quirino of the Philippines. The price was reportedly in excess of $100,000. The plant's molds, blast furnace and other equipment will be shipped to the Philippines.

Metals Disintegrating Co.

Metals Disintegrating Co. Inc., Elizabeth, N. J., manufacturer of metal pigments, metal powders and metal abrasives, appointed Roy A. Ribelin Distributing Co., Houston, as distributor for aluminum pastes and powders and gold bronze powders in southeastern Texas.

Utility Firm Plans Expansion

Consolidated Gas Electric Light & Power Co., Baltimore, plans to acquire a tract of 108 acres in Ann Arundel county as a site for a new generating plant. Plans call for the erection of an initial unit of 100,000 to 125,000 kilowatt capacity.

Linde To Build Ohio Plant

Plans are being completed by Linde Air Products Co., a division of Union Carbide & Carbon Corp., New York, for a liquid oxygen and argon plant to be constructed at Ashtabula, O. Gases produced in the plant will be used principally by the steel and metalworking industries of the Ashtabula and adjacent areas. The plant will be built on the property of Electro Metallurgical Co., another division of Union Carbide, on Lake East road. Orders for equipment for the new plant have been placed. Operations are scheduled to begin in mid-1952.

Koppers Expands on Coast

Koppers Co. Inc., Pittsburgh, expects to place its first West Coast plant in operation around the middle of October. The $1 million plant is south of Fontana, Calif., about two miles from Kaiser Steel Corp.'s steelworks. A major expansion is planned for Koppers' Fontana plant after its initial operations get under way. S. J. Katz is the Pacific Coast district manager.

Thompson-Muskegon Merger

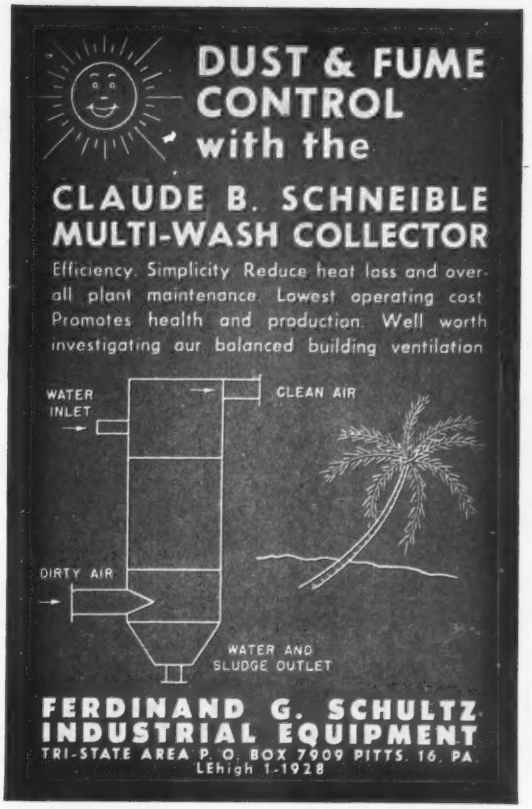
Muskegon Piston Ring C., Muskegon, Mich., and Thompson Products Co., Cleveland, have agreed to merge, subject to approval of Muskegon stockholders. The Muskegon firm makes piston rings in that city for sale to manufacturers of internal combustion engines of all types. The company also has two foundries at Sparta, Mich., for the production of large quantities of piston ring castings. These foundries will assure Thompson and its wholly-owned subsidiary, Ramsey Corp., St. Louis, of an adequate supply of castings to meet requirements for rings sold in the export and jobber replacement markets, fields in which Muskegon does not participate. Present management of Muskegon would continue to direct the company, says Frederick C. Crawford, president of Thompson Products Co.

Opens Chicago Warehouse

General Refractories Co., Philadelphia, opened its newly - constructed warehouse at 4242 W. 45th St., Chicago. Manager of the new property is Roger W. Braden, having been transferred from New York where he had been manager of the company's warehouse in that city.

Tubesupply Formed on Coast

James A. Baxter, John De Young and Robert Brinkley organized Tubesupply, establishing offices at 1048 Sixth Ave. S., Seattle, to distribute tubing items representing Tube Sales, Los Angeles. Mr. Baxter had been assistant sales manager and Mr. De Young assistant purchasing agent for Seattle Steel Co., both resigning to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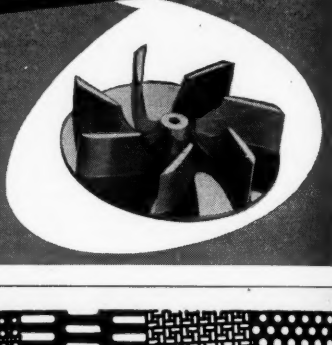

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join Mr. Brinkley who previously represented Tube Sales. They plan active expansion of the tubing business.

Rand Plans Research Center

Rand Corp., Santa Monica, Calif., will construct a $2 million building for endowed scientific and development research in that city. Rand Corp. is successor to Rand Project, top-secret research and development agency operated by Douglas Aircraft Co. Inc. in World War II.

Dynamatic Builds Laboratory

Dynamatic Corp., subsidiary of Eaton Mfg. Co., Cleveland, is building a research and development laboratory in Kenosha, Wis. The building, estimated to cost in excess of $100,000, will have an equipped value of $500,000.

Little-Beaver Co. Moves

Little-Beaver Co., Baltimore, manufacturer of aluminum storm doors and windows and fabricator of other products, moved into larger quarters at 1507 Ashland Ave.

Chain Belt Builds Warehouse

Chain Belt Co., Milwaukee, is constructing a warehouse in Portland, Oreg. Besides housing increased stocks of chain, sprockets, power transmission equipment, take-ups, elevator buckets, belt conveyor idlers, and spray nozzles, the new building also will contain the company's Portland district sales office.

Worthington Opens Branch

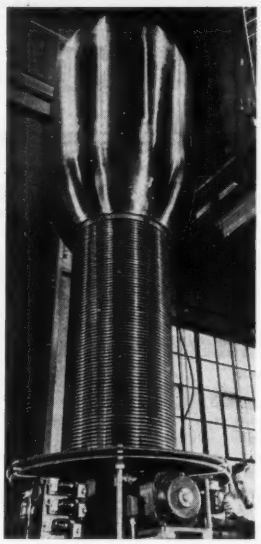
Worthington Pump & Machinery Corp., Harrison N. J., opened a branch office in Harrisburg, Pa., at Second and Locust streets. The office will be in charge of A. L. Mays and will be a branch of Worthington's Philadelphia office.

Moves Oakland Warehouse

Oakland Division, Ziegler Steel Service Co., Los Angeles, moved into a new building at 727 Sixty-sixth Ave., Oakland, Calif. In operation for two years, Ziegler's San Francisco-Oakland warehouse stocks sheet, strip and bar steel in hot-rolled, hot-rolled pickled and cold-finished grades.

Dresser Equipment Co. Sold

Keystone Driller Co., Beaver Falls, Pa., purchased the cable tool drilling machinery business of Dresser Equipment Co., Columbus, O. Dresser Equipment is being moved to the Beaver Falls plant of Keystone,



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says Harold J. Ruttenberg, president of Keystone.

Norton To Boost Production

Increased facilities for manufacture of silicon carbide grain are planned by Norton Co., Worcester, Mass. Two of the present abrasive mills in that city will be re-equipped by the company. By combining the crushing and milling units now housed in these two mills, Norton's processing of silicon carbide grain will be increased 30 per cent.

Weatherhead Names Agents

Weatherhead Co., Cleveland, manufacturer of tubing and pipe fittings, appointed the following distributors who will carry stocks of various Weatherhead products: B. H. Deacon Co. Inc., Philadelphia; Knox Inc., East Walpole, Mass.; Spence Tool & Rubber Co., Peoria, Ill.; P. T. Standard Parts Co., Pontiac, Mich.; Diesel Injection Sales & Service, Norfolk, Va.; Harry Cornelius Co., Albuquerque, N. M.; Hardware & Supply Co., Akron and Massillon, O.; Hydro Pneumatics Inc., New York; Robins Rubber Division, A. K. Robins & Co. Inc., Baltimore.

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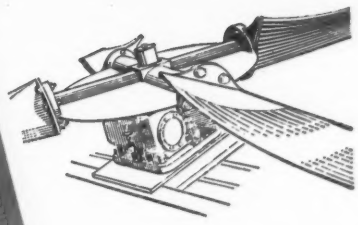

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